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THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR JANUARY 1866.

ART. I.—*Researches on Typhus Fever, based on Observations made during the Winter and Spring Months of* 1864. By J. M. DA COSTA, M. D., one of the Physicians to the Pennsylvania Hospital.

THE occurrence in several of our cities, during the last year, of a fever of a low type, dissimilar to the enteric fever which we are mainly accustomed to meet with—in other words, the existence in our midst of a fever with the characters of true typhus—is a matter which has not escaped the attention of the profession. Indeed, there are many indications that the same typhus wave which has swept so ruthlessly over several of the countries of Europe has reached our shores, and has left on them its distinct impress. Typhus fever, as is well known, is not a disease that can be said to be indigenous to the United States; and though at different times it has prevailed extensively, and though at all times cases of it are likely to be found in our seaboard towns, yet its presence in an epidemic form is not so frequent as to preclude the necessity of studying and portraying the traits it may display. In this paper, based on the examination of many cases of the disorder that have passed under my observation, I shall endeavour to give a sketch of the fever which has prevailed in Philadelphia for at least one year, and which, I think, exhibited some peculiarities which it may prove useful to record. Indeed, in the following remarks, I shall dwell on these peculiarities rather than attempt a general description of typhus fever, contrasting, as I proceed, the phenomena observed with those which the history of many epidemics has made us regard as the standard expression and history of the disease. To avoid reiteration, I may here state that the materials from which my description is drawn were collected partly in private practice, partly at the Philadelphia Hospital, but chiefly in the wards of the Pennsylvania Hospital, and that I have been much

aided in gathering them together by the intelligent zeal of the Resident Physicians, Drs. Andrews and William Pepper.

The affection may begin with a chill, followed by fever which continues without remission. But in many cases pain in the back and limbs, loss of appetite, and looseness of bowels precede the febrile phenomena; symptoms which last, indeed, after the fever has fairly set in, and are in some instances associated with epistaxis. The fever is attended with a dry tongue, a flushed face, a watery eye, prostration, some dulness of hearing, and mental hebetude, but, in its earlier stages at least, very rarely with delirium. Between the fourth and seventh days an eruption appears on the skin, scattered over the abdomen, chest, and thighs, more rarely over the arms; at first much modified by pressure, but soon little influenced by it, and remaining until the decline of the malady. As the disease reaches the second week, all the symptoms of low fever become strongly marked; the teeth and lips are covered with sordes; the tongue is tremulous; the prostration and delirium or other signs of nervous derangement are more evident. The patient is often deaf; his skin cooler than during the first manifestation of the affection; the pulse ranges from about 100 to 130; the bowels in many instances retain their irritability. The subsequent progress of the case, from the end of the second week, depends greatly upon the violence of the disorder, and the termination to which it inclines: if unfavourable, depression and stupor increase, involuntary passages happen, and the patient dies exhausted; if favourable, a gradual brightening of the face, a moist tongue, and a slower pulse foretell the fortunate issue.

Such is an outline of the symptoms of the complaint as commonly seen. From even this brief description the reader will be struck with the fact of the occurrence of symptoms, such as epistaxis and diarrhœa, which are more usual in the enteric form of continued fever. But we shall best be able to appreciate in how far they belong to the disease by subjecting its principal features to a more detailed analysis, and, at the same time, its complications, of which as yet no cognizance has been taken, may be noticed.

Mode of Invasion.—In some instances the access of the disorder is sudden, even violent. This happened in two cases. In one there was severe chill, soon succeeded by wild delirium and coma; in another, a nurse, while bending over the fever patient, was seized with faintness and nausea, which were followed by a very grave attack of the malady. But these are exceptional cases. In by far the largest number the disease does not begin suddenly, nor is it ushered in by a chill. Thus of 23 cases besides those referred to, in which particulars of the onset of the affection could be obtained, a chill is only noted to have occurred in 6; in two of which it is described as a chilly sensation rather than a marked rigor, and one of which was a fatal, another a protracted case. The other early symptoms were headache, giddiness, pain in the back and limbs, loss of

appetite, nausea, vomiting, sleeplessness, diarrhœa, epistaxis, cough, and palpitation. Of these, the pain in the back and lower extremities was the most constant; indeed, there was scarcely an instance in which it was found to be absent. Next in order was headache, sometimes frontal, but sometimes in the back of the head. Nausea and vomiting are mentioned in 8; nausea without vomiting in 1; a catarrhal cough with mucous expectoration in 4; severe palpitation, associated with epigastric pain, in 1 of the 23 cases. The symptoms referred to mark the commencement of the disease, and are soon combined with fever and quickened pulse; but, associated with lassitude and dejection of spirits, one or several of them may happen as premonitory signs. In several of the cases the prodromes were of a week's duration; but, as a rule, they did not precede the febrile attack for more than three or four days.

Symptoms.—In analyzing these, we shall begin with the *physiognomy*. The face of the patient is characteristic. The expression is dull, and shows no signs of suffering. Very generally the face is flushed—not deeply, but uniformly. In no instance was it of livid hue, and, as a rule, its colour was not so deep as it usually is in marked cases of typhus fever. The eye is always suffused, the conjunctiva commonly more or less injected, the pupil small. The appearance of the eye is so striking that it is in itself almost a certain sign of the disease, and, when joined to the hue and expression of countenance, forms a physiognomy which stamps the affection. Nor do these traits manifest themselves late in the disorder. Frequently, indeed, patients were admitted to the hospital in whom the malady had not reached its sixth day, but whose features bore already the unmistakable impress of the fever. Nay, many a patient applying at the gates, for the relief of unaccountable lassitude and debility, exhibited a countenance which at once proclaimed their real cause. The flush on the face, and peculiar eye, continue during the fever. The former gradually disappears as decided convalescence approaches; so does the suffusion of the eye. The injection of the conjunctiva vanishes, as a rule, before the flush on the cheeks; but in some of the cases it is noted to have been protracted into convalescence.

The *skin* is, as a rule, dry and of elevated temperature, which towards night is increased. But very few cases present that burning, pungent heat which is so much dwelt upon as belonging to the disease. Thus in 16 cases which progressed without complications to a favourable termination, only one, a boy, exhibited the "calor mordicans." Of the others the record says: in 1 considerable heat and dryness of skin; in 4 cases skin hot and dry, in one of which it remained so only a few days, and then is noted as pleasantly warm and supple on the extremities, and hot on the abdomen; in 1 hot but moist; in 7 the expression warm, or moderately warm, or somewhat heated, is used; in 1 the skin was hot and moist, and profuse sweats took place during convalescence; in 1 hot, and its dryness or

moisture is not mentioned. The increased temperature does not continue without abatement throughout the whole course of the malady. About the middle of the second week it falls, and the skin begins to lose its dryness. During convalescence it is cool, and desquamation is not unusual. A peculiar and offensive odour is only noted to have occurred in a few instances. In those cases in which complications happened, burning heat of skin is mentioned in a larger proportion. But as several of these complications were visceral, especially pulmonary inflammations, the very great heat of surface is as likely to have been determined by them as by the typhus fever.

The *pulse* is feeble and devoid of hardness. Occasionally it is found to be of good force, though small, even at the height of the disease; yet this is very exceptional. At the onset of the fever it may be strong and full, but it soon loses its strength and volume, and becomes very compressible. A bounding, tense pulse was not noticed in a single instance, no matter what the complication. The cases in which the force or volume of the pulse remained good, all recovered. As regards the frequency of the pulse, it was generally above 100. In twenty-one cases of average severity, not having any special complications, and ending favourably, it reached above 100 in all save three. In nine it was 120; in five between 120 and 130; in two between 130 and 136; in three between 92 and 100; in one 100; in one 88. In this case the pulse, before the fever left, sank to 64, but though so slow, the attending symptoms were those of considerable prostration, and the case was not a light one. The most frequent pulse recorded in the cases not terminating in death was 166. It was accompanied by violent delirium, and by such intense restlessness, that the patient had to be strapped in bed. In all the fatal instances the pulse was above 130; in one it was 156, in another 144. In cases complicated with pneumonia, it reached the latter figure. Great frequency of pulse is, therefore, a bad sign. It indicates either a very severe form of the disorder, or a visceral complication.

The evening pulse is apt to be a few beats more than the morning pulse; but in no case noted did the rise exceed twelve. A decided fall in the pulse is, as a rule, a sign of approaching convalescence. Whilst the malady is at its height, the pulse does not exhibit any marked variations, but as soon as the fever begins to decline, the pulse becomes slower, and often somewhat fuller. This steadiness of the pulse for days is very striking. In a number of instances in which it was carefully observed at about the same hour daily, it scarcely varied by a beat from day to day; its fall was the precursor of a favourable issue, and indeed became an indication of it before any other symptoms pointed distinctly in that direction.

In connection with the pulse, the state of the heart may be mentioned. The weakening of the first sound, and of the impulse, are phenomena as commonly witnessed in this as in other epidemics.

The *eruption* is very constant and significant. It is so constant that I

met with it in every well-marked instance of the disease. It was only absent in a few very light cases, the nature of which, moreover, was doubtful. It is not petechial, true petechiæ having been observed only twice in about fifty cases. Its characters may be thus summed up: A reddish eruption scattered all over the body, excepting on the neck and face, most evident on the chest and abdomen, where, indeed, it begins. The spots, when they first appear, are not so dark as those of measles, of lighter hue, indeed, and less coarse than I have often seen them in typhus fever on former occasions. They are of very unequal size; some are quite large, others not much larger than the rose rash of typhoid fever. The larger spots at first disappear, or almost entirely disappear upon pressure, and the change of colour takes place from the circumference to the centre. The smaller spots are less influenced by pressure. Indeed, the larger spots become the smaller, hence the latter are a later development of the eruption than the former. Neither is decidedly elevated, nay, though a slight rise above the skin may be made out, it is difficult to establish, and its occurrence is not free from doubt. After the eruption has lasted a day or two no elevation can be detected; the rash is darker, though still reddish, and far less influenced by pressure. It disappears in part only, and thus it may remain until it fades; or it becomes more fixed, and does not change on pressure. But instances are not unusual in which the spots are very much affected by pressure throughout the whole malady.

A redness of the skin, less defined than the spots described, and lying between them and of a much paler hue, is often met with to a greater or less extent; examples, too, of sudamina are not wanting. The spots are generally very distinct, and may even be recognized in mulattoes. They appear on or about the fifth day, do not come out in crops, and pass away with commencing convalescence, though they may still be sometimes recognized while all the other signs are already betokening rapidly returning health. Of 7 cases admitted into the hospital on the fifth day of the fever with distinct eruption, it had all but faded in 2 on the twelfth day; in 1 only a few traces were to be seen on the fourteenth day; while in 1 it could still be detected, though it was very faint, up to the nineteenth day of the malady, and at least five days after fairly established convalescence. In one case, first examined on the seventh day of the disease, the spots were scarcely visible on the thirteenth; in another, the eruption appeared on the fourth day, was almost gone on the tenth, but could still be traced up to the sixteenth day.

From an early period of the complaint the *tongue* becomes altered, and keeps its unhealthy look to the end of the fever. Early in the affection and at its height the tongue is almost uniformly observed to be coated, though not heavily so, and is usually dry. The coat may extend over the whole organ, but it is not uncommon to find it only on the middle or in streaks, the tip and edges being red. An analysis of 25 cases ending in recovery

gives this result: Tongue dry and coated, 7; dry, glazed, and fissured, 1; dry, fissured, and heavily coated, 1; coated and moist, 6; whitish or yellowish coat, red edges and tip, 10. In those embraced under the last head the tongue was mostly dry, and the coating was only heavy at, or was confined to the centre, or existed in light streaks. A blackish crust was noticed in several of the graver cases. In one of these the organ was first smooth and coated and then dry and dark. Moisture and cleansing of the tongue were favourable symptoms preceding convalescence; so was it favourable when the tongue from being dry and coated in patches, became moist and more generally coated. A tremulous state of the tongue is mentioned in a number of the notes of the severer cases just analyzed. In 4 fatal cases the tongue from having been moist became dry and glazed in 1; in 1 it became dry and was with difficulty protruded; in 1 it was at the beginning dry in the centre and coated, but was moist and very tremulous towards the end; in 1 it was moist at the tip and brown and dry at the centre, and tremulous; and in both of the last two cases the tremor was associated with obvious trembling of the lower jaw.

The *loss of appetite* and the *thirst* present nothing peculiar. They occur as in most continued fevers. *Nausea and vomiting* were noted in about one-fourth of the cases. In all they were early symptoms, happening either at the very onset of the disease or in its first days.

As regards the *intestinal symptoms*, it was observed that in 31 cases the bowels were regular, open not less than once in twenty-four hours in 4; sluggish, inclined to costiveness in 5; constipated in 9; decidedly loose in 13. One of the cases included in the second category had at first slight diarrhœa. On the other hand, in two included in the last, the bowels became regular, and in two others costive, before the fever left. In one they were at first bound and then became relaxed; but generally the looseness commenced early in the malady and continued more or less decidedly until convalescence. Those classed as constipated were for the most part such persons in whom it became necessary to resort to injections or laxatives to procure a passage. The diarrhœa, as a rule, occurred in the severer cases. The number of passages varied from four to twelve in the twenty-four hours. They were thin, and small, feculent stools, often offensive, and of yellowish colour. In one instance they are spoken of as having been attended with griping pains.

This is certainly a curious and exceptional state of things. Diarrhœa, so common in typhoid fever, is generally reported to be very rarely met with in typhus. In only 15 cases of 144, says Dr. Murchison in his elaborate work on Continued Fevers, was there any approach to diarrhœa. Here we find 13 out of 31 presenting this symptom in a marked degree: and as this condition formed so often a prominent feature of the epidemic malady under discussion it may not be amiss to record some illustrative cases.

CASE I. *Typhus fever with diarrhœa; four to six passages daily;*

epistaxis; recovery.—Mary H., æt. 14, admitted April 11, 1865, into the Pennsylvania Hospital, bed No. 36, from a district of the city where typhus prevails. Was seized about April 5th with chill, followed by fever, pains in abdomen, vomiting and purging, anorexia, headache and backache. Day before admission had free epistaxis, and the diarrhœa has continued until present time, about six stools daily. Eruption not profuse; generally diffused, though mostly on abdomen; not altered by pressure.

April 12. Pulse 120, feeble. Tongue very dry and lightly coated in centre; eyes suffused and somewhat injected; pupils of good size; considerable heat of skin; bowels opened four or five times; no vomiting; belly meteoric. She is very drowsy, moans, and once or twice has been delirious, getting out of bed; but her answers are perfectly correct and her memory good; voice strong and tone natural. Ordered acid. nitromuriatic. gtt. iv every fourth hour. Whiskey ℥vj daily. Beef-tea.

13*th.* Bowels four times opened; thin, feculent stools; tongue rather less dry; eyes somewhat heavy and injected, but her expression is good and her mind quite active; some dulness of hearing; retains urine a long time; vomited a little yesterday morning; belly slightly meteoric; no ileo-cæcal gurgling or pain; pulse 120, rather feeble; skin hot and dry; sordes on teeth; eruption as before. Increase whiskey to ℥viij.

14*th.* Bowels open five or six times during past twenty-four hours; lies on back during sleep with mouth wide open, eyes not entirely closed; sordes on teeth; head drawn back; pulse 120, small but of better force; pupils normal; considerable thirst; slight cough; eruption as before.

15*th.* Brighter; tongue dryish in centre; bowels opened this morning; pulse 108, gaining force.

17*th.* Expression of countenance very much brighter; tongue soft and slight coat in centre; pulse 84, of good force and volume; bowels opened once in twenty-four hours, stool of moderate consistence, and light coloured; eruption almost disappeared, spots have a brownish hue; stop acid; give four grains of quinia daily.

19*th.* Slightly deaf still; tongue clean and moist; eye bright and intelligence very good; pulse 80; eruption almost gone; bowels regular; appetite good; sleeps well.

20*th.* Rapidly convalescing; bowels regular.

24*th.* Leaves hospital cured; pulse about 80; no cardiac murmurs, though heart's action still much increased by movement or any gastric disturbance; voracious appetite and gaining flesh.

Sometimes, as previously stated, the bowels are at first constipated, but diarrhœa then sets in, and a looseness of bowels remains until convalescence.

CASE II. *Typhus fever with diarrhœa succeeding to constipation; epistaxis; recovery.*—W. P., æt. 28, admitted into the hospital April 4, 1865. Born in Millville, New Jersey; has followed the sea since twelve years of age; last voyage from Wilmington, N. C.; was ashore a good deal at Wilmington. Had occasional nausea, and pain in limbs and head, on voyage up. Was taken ill on March 31st with an imperfect chill, followed by high fever, pain in head, back, and limbs; some pain in abdomen; bowels costive; no epistaxis.

Upon admission, pulse 130, feeble; skin hot and dry; tongue dry and coated; eyes congested; countenance dull; appearance of profound languor; coarse eruption on trunk and extremities. To take acid. nitromuriatic. gtt.

vj every third hour. Beef-tea and milk-punch ℥ij of each every second hour.

April 5. Pulse 124; respiration, 30; eyes still congested; tongue coated and dry in centre, moist along edges; bowels opened twice; epistaxis from both nostrils; hebetude, yet mind seems clear; no appreciable deafness.

6*th*. Slept badly; bowels opened three or four times; stools thin; no more epistaxis; hebetude and drowsiness; eyes still congested; tongue dry, slightly coated in centre; pulse 124, small and feeble; eruption scarce, same as before; mind clear when roused, but expresses wish to die; belly meteoric, neither gurgling nor pain; urine sp. gr. 1022, slightly acid, no albumen, chlorides almost absent.

7*th*. Skin cool; pulse 124, very feeble and small; tongue dry. Whiskey f℥xviij daily; beef-tea continued; whiskey given partly in milk.

8*th*. Intelligence same; bowels opened several times; passes water freely; pulse very small and feeble; eruption still visible; abdomen meteoric; urine sp. gr. 1022, slightly acid, chlorides very deficient, no albumen; urates in casts. Whiskey f℥xxiv.

9*th*. Drowsy, but more easily roused; pulse 111, gaining strength; tongue less dry; hearing better; eyes still suffused and congested, with small pupils; passes urine; bowels opened quite frequently; no subsultus; no tinnitus. Tr. opii gtt. xxx by injection.

10*th*. Drowsy; bowels opened about three times during night; skin pleasantly warm on extremities, hot on abdomen; pulse 102, much stronger; belly meteoric; eruption very scarce, but still visible; passes his urine voluntarily; no cough; eyes less injected; tongue dry; flapping of veins of neck.

11*th*. Heavy, disposed to sleep; tongue less coated, dry and smooth at tip; moist at edges; eyes injected, pupils small; skin moderately warm; pulse 100, of good volume and increasing strength; belly tympanitic; bowels quiet; eruption visible; urine sp. gr. 1020, acid, chlorides increasing, no albumen, urates. Face has a bloated appearance. Reduce whiskey to f℥xviij.

12*th*. Less heavy; hearing good; eyes less injected; no cough; belly slightly meteoric; pulse 88, good volume and force; tongue cleansing and moist at edges.

13*th*. Less heavy; eyes still slightly injected; skin warm; tongue only dryish, and clean; bowels opened three times last night; pulse 80, compressible; eruption still visible; pulse 66 at 11 o'clock, of fair volume; urine of sp. gr. 1011, acid, abundant chlorides, no albumen; no abnormal deposit.

14*th*. Eyes clearer; complains of feeling dull; tongue dry and glazed in centre; bowels opened four times since yesterday, the stools becoming consistent; sleeps a great deal, but when aroused, mind is active; belly of normal shape; skin pleasantly warm; pulse 81, small and compressible; only a trace of eruption. Acid twice daily, and quinia gr. vj daily. Reduce whiskey to f℥xv.

15*th*. Pulse 78, compressible; tongue dryish; skin supple and moderately warm; intelligence good when he is aroused, answers being correct, but he is very drowsy; belly normal.

16*th*. Bowels opened three times; pulse 66, of good volume and force; tongue moister, with patches of soft coat; intelligence good; eyes clear; eruption scarcely visible.

17*th*. Intelligence good; tongue clean and soft; belly rather flat, with

a few traces of eruption; pulse 75; bowels opened two or three times; good appetite, not much thirst.

21*st*. Sitting up; rapidly gaining in every respect.

In the following case the diarrhœa formed an even more prominent feature of the malady, and persisted also throughout the attack :—

CASE III. *Typhus fever with diarrhœa from onset of disease; bowels remained loose during its whole course; epistaxis; recovery.* —J. S., æt. 21, admitted into the Pennsylvania Hospital April 28, 1865; born in Philadelphia; a sailor—last trip from Delaware Bay. Felt prodromes of this attack about eight days ago; pain in head and back; flushes of heat; anorexia; epistaxis. Since Tuesday last he has been confined to bed; the epistaxis was repeated, bowels opened five or six times daily, with occasional griping pain in stomach, also prostration, and considerable sweating.

On admission, skin was moderately warm, inclining to moisture; tongue coated, but moist; pulse of fair force though small; belly meteoric with distinct eruption; eye slightly congested, pupil rather small; cheeks flushed. Acid. nitromuriat. gtt. vj every four hours; two oz. of beef-tea and milk-punch every two hours. During night, as bowels were frequently opened, gtt. xxxv tr. opii by enema were given, and after that he slept quietly.

April 29. Face flushed; intelligence very good; quite loquacious; eye very slightly injected, pupil normal; tongue heavily coated, yet is moist; considerable cough, white mucous sputa; skin warm—moisture on forehead; pulse 96, of fair volume, but compressible; belly slightly meteoric; no pain or gurgling; eruption scattered all over body, most marked over hypochondria; slightly elevated and much modified by pressure. Urine sp. gr. 1005, chlorides almost absent, no albumen, very pale, slightly acid. Respiration harsh, with coarse, dry, and moist râles postero-inferiorly.

30*th*. Coughs considerably with white mucous sputa; face very much flushed; capillary circulation rather stagnant; eye clear; pupil normal; skin cool; tongue coated, inclining to be dry; some epistaxis yesterday afternoon; bowels opened ten times since yesterday morning—thin, yellowish stools; pulse 80—compressible. Eruption quite copious, coarse, much darker than tâches rouges. Many of the spots almost disappear under pressure, but some of them are quite persistent. Whiskey increased to f℥xij. Tr. opii gtt. xxx by enema; stop acid., give quinæ gr. xij daily.

May 1. After injection yesterday bowels were not opened until night, during which, however, he had about three very large thin stools. This morning pulse 96, rather small and feeble; intelligence very good; hearing fair; some tinnitus aurium; eyes clear, pupils normal; respiration attended with coarse, dry, and a few moist râles, and harsh murmur over postero-inferior part of both lungs; belly becoming scaphoid; eruption very distinct; spots dark, and very many of them do not disappear under pressure; urine sp. gr. 1014, chlorides almost absent, no albumen, slightly pale, almost neutral, no deposit; tongue moist, slightly coated; lips cracked. Tinct. opii camph. f℥j with aq. camphor. f℥ij, to be taken when bowels are loose.

The subsequent progress of the case was marked by a gradual decline of the diarrhœa, which, if not arrested, was kept in check by the paregoric. On the 5th of May, the patient was rapidly gaining strength. The eruption was much faded; the bowels had been opened four times in twenty-four hours. After that the bowels, though slowly becoming more regular,

remained loose during his entire convalescence, which, on the whole, progressed favorably. Soon after the 12th of the month he left the hospital.

While engaged in analyzing the frequency and character of the stools, some other abdominal symptoms, such as meteorism, pain, and gurgling, may be inquired into. *Meteorism* was observed in fully one-third of the cases. In 30 cases its existence is noted in 11, in the remainder the state of the abdomen is indicated as normal, as supple, or is not specially mentioned. Though in all the cases in which the symptom is spoken of it was well-marked, and the abdomen unnaturally full, in no case did the tympanitic distension reach extreme limits. *Gurgling* was not encountered in a single instance, at all events, there is not a single record of its occurrence, and in very many of the notes its non-occurrence is distinctly stated. *Abdominal pain* and tenderness were rare symptoms, and when met with, the tenderness was never great nor limited to any particular spot. In one case its seat was chiefly epigastric.

Cough is very commonly present. It existed in fifteen of twenty-eight cases, not counting those in which it was associated with pneumonia. It is generally connected with bronchitis, and is found to coexist with coarse, dry, or moist râles; and with a slight though tenacious mucous expectoration. In several instances the catarrhal condition of the bronchial tubes preceded the fever. The cough is rarely very frequent, nor is it a source of annoyance. It may be conjoined to more or less hypostatic congestion of the pulmonary tissue, and then the percussion resonance is decidedly impaired. But hypostatic congestion was also noticed when no cough or expectoration happened, and did not reveal itself except by the physical signs—the altered percussion note, the harsher, more bronchial breathing, or the persistent crepitating râles.

The *respiratory movements* are usually somewhat accelerated. At the height of the febrile malady they are apt to range from twenty-four to thirty-two, even in cases in which there are no chest symptoms. In one patient, however, they never rose above twenty-two, though his pulse beat from 108 to 120. The breathing is, as a rule, regular, and, indeed, normal in all save its frequency, unless there be a pulmonary complication. In some cases the rapid respiration forms a prominent feature, and may even be attended with a comparatively slow pulse. This happened in a man twenty-seven years of age (Richard P., Bed 28), who had much subsultus, delirium, and tube-casts in the urine, whose pulse was of fair volume and force, and ranged from 88 down to 64, though the respirations were forty in the minute.

In this curious case, which ended in recovery, the frequent respirations were not due to any discoverable morbid condition of the lungs. Nor were they in the following, in which the pulse bore a more normal proportion to the respiratory movements:—

CASE IV. *Typhus fever; shallow respirations, forty in the minute;*

great prostration and muscular tremour; recovery.—P. B., æt. 30, a labouring man, admitted into the Pennsylvania Hospital, April 24th, 1865, lives at 21st and Shippen Sts. Felt symptoms of attack seven or eight days ago, viz., violent pain, especially in back of head and small of back; cough, with tough mucous sputa; vomiting and looseness of bowels; has become rapidly prostrated.

April 25. Considerable hebetude and some deafness, though answers are correct when his attention is fixed; face uniformly flushed; eyes suffused, with small pupils; tongue dryish and coated; sordes on teeth and lips; considerable muscular tremour, with slight subsultus; bowels opened freely two or three times; urine free, sp. gr. 1019, acid, chlorides almost absent, no albumen, amber colour, deposit of rosette phosphates, granular urates, few fragments of tube-casts; skin hot, with a copious coarse rash over whole surface, except face, but most marked on thorax and abdomen, the large spots somewhat modified by pressure, the small ones scarcely at all; pulse small, compressible. Ordered milk-punch and beef-tea every second hour; acid. nitromuriatic. gtt. vj every fourth hour. In the afternoon, as the pulse had increased in frequency, the amount of whiskey was increased to f℥j every hour, and toward midnight, the pulse being still more compressible and feeble, and 120 in minute, and the tongue very dry and tremulous, the amount was further increased to f℥iss every hour, and the acid given every three hours.

26*th.* Expression somewhat better, though still dull and heavy; eyes suffused, pupils small; yet intelligence is perfect, though slow; occasional cough; respirations very shallow, 40 in minute; a few moist râles at posterior lower part of lungs; skin hot, and inclining to moisture; pulse 108, very compressible; tongue dry, brownish, and fissured, though not deeply, and tremulous; no muscular tremour or picking of the bedclothes; some sordes on teeth; bowels opened twice; eruption very abundant, and some mottling of trunk; decided odour; cardiac impulse feeble; first sound very feeble; urine sp. gr. 1013, acid, chlorides very deficient, slight amount of albumen, amber colour, urates, and tube-casts.

27*th.* Expression heavy, dull, and fixed; very slight deafness; eyes much congested; pupils small; face flushed and hot, inclining to moisture on forehead; tongue well-shaped and moist at edges, but thickly coated and very dry and fissured in centre; some sordes on teeth; no muscular tremour, and tongue less tremulous; cough very rare; respiration still very frequent and shallow; belly meteoric; no pain nor gurgling; bowels opened twice during night; urine sp. gr. 1011, rather more chlorides, opalescent by heat and nitric acid, pale colour; eruption as before; mottling of trunk less distinct.

28*th.* Much improved; intelligence quicker; hearing better; pulse 95, gaining force; heart sounds more forcible; skin cool and soft; belly large, tympanitic; bowels opened twice; urine very free; respirations about 32, fuller; eye much clearer, pupils still small; tongue less tremulous, becoming moist; eruption as before, large spots still very much modified by pressure, but spots are smaller than before, and mottling of trunk less distinct; nose bled a few drops; urine 2210 cubic centimetres, sp. gr. 1014, alkaline at end of twenty-four hours, very deficient in chlorides, no albumen, deposited heavily phosphates, radiating urates, some epithelium, and a few small tube-casts.

29*th.* Pulse 92, and gaining strength; expression better; face has nearly lost its flush; eye less injected; tongue still heavily coated and slightly

tremulous; belly large, supple; bowels opened twice; skin moderately warm; eruption fading; slight cough; some sordes on lips and teeth; spots much smaller and less distinct, small ones do not disappear under pressure, large ones disappear under forcible pressure, and both are influenced by pressure, though eruption has already passed its height. Whiskey reduced to f℥xv daily.

30*th.* Expression much better; less flush of face; tongue less coated, very tremulous; skin warm, supple, moist on trunk; pulse 72, of good force and volume; bowels twice opened; eruption very much faded; whiskey reduced to f℥xij; urine (April 30th to May 1st), total quantity 1100 cubic centimetres, depositing urates and phosphates, sp. gr. 1022, chlorides increasing, no albumen, light amber.

May 1*st.* Drowsy; eye clear; face looks somewhat emaciated, as the flush has disappeared from cheeks; considerable cough, but slight expectoration, and no marked râles; tongue moist, tremulous; belly large; eruption nearly gone; pulse 83, of fair force; eruption on back but little modified by pressure; bowels twice opened.

2*d.* Pulse 80, gaining force; tongue moist and clean, and but slightly tremulous; eruption losing its distinctness; eye clear; mind rapidly becoming more active; but little cough.

In the case just detailed the respirations were more specially deranged in frequency. But they may be at the same time noisy, without there being any signs of a pulmonary lesion, none certainly save congestion, and that not sufficient to account for the hurried and very much altered breathing.

CASE V. *Typhus fever; great prostration; respiration* 50 *and noisy; death.*—Matilda W., native of Ireland, æt. 28, admitted into the Pennsylvania Hospital, Feb. 11, 1865, had been sick about four days. On admission the symptoms were as follows: Tongue slightly coated in streaks; moderate heat of skin; pulse 94; coarse spots influenced by pressure, though not quite disappearing on pressure, found plentifully dispersed on chest, and abdomen, and extremities; headache, but mind seems perfectly clear; bowels somewhat loose; no pain on pressure in iliac fossæ; two passages this morning.

Feb. 12*th.* Pulse 100; about the same in other respects. Acid. nitro-muriatic. gtt. iv every four hours; to be sponged twice daily with vinegar and water, and cold water applied to head.

13*th.* Pulse 104; face flushed this morning; tongue still red, perhaps redder than it was, and still yellow streaks on each side of centre; two watery stools last night. In the evening pulse 116.

14*th.* Pulse 108 to 112, very compressible; eruption still plainly visible; mind clear; throat and tongue dry, of brownish colour. Ordered ol. terebinth. gtt. x every four hours; 1 oz. beef-tea every three hours. P. M., pulse 124; very restless; constant desire to get out of bed; mind duller; turpentine to be given in ℥ss of camphor water; ℥ss whiskey every second hour.

15*th.* Pulse 116; tongue dry; still some headache, but mind clearer than last night; continue turpentine, and whiskey in milk, also beef-tea every two hours. 7 P. M., pulse 132; skin very hot; necessary to use bandages to keep her in bed; bowels open to day; passes her urine well.

16*th.* Pulse 116 to 120, has more volume; tongue still dry, but moister than yesterday; mind clearer; seems to answer with more readiness; eruption still distinctly visible; mutters to herself in low tones; not much heat

of skin; bowels open to day. Ordered f℥ss whiskey every hour till evening, then ℥j every second hour; continue beef-tea, milk, and medicines, except acid. Afternoon the tongue was again very dry, and protruded with difficulty; and the pulse feebler.

17*th*. Did not sleep during the night; took her food and whiskey regularly, and without trouble; pulse 124, feeble; tongue protruded with difficulty; appears to be rational in some answers, but is very feeble and constantly muttering; counter-irritation in the shape of sinapisms continued to back of neck; whiskey every hour till evening. At 6 P. M. pulse 124, remains of very feeble volume; respiration 50, noisy; no dulness on percussion anteriorly; no marked auscultatory signs anywhere, except a few coarse râles on left side; bowels moved three times this evening; heart sounds decidedly feeble; so is impulse; whiskey has not increased pulse since noon; continued 1 oz. whiskey every hour, also the turpentine and turpentine stupes to back of chest. At midnight pulse very feeble, 140; whiskey somewhat diminished, six drachms every hour, but ten drops of chloroform every two hours; the turpentine was stopped for the night; nourishment given as freely as possible.

18*th*. 1½ A. M. pulse very rapid and feeble; feet, legs, and arms were cold; warm water to feet; mustard plasters to legs, and teaspoonful of ether internally. 8 A. M. pulse still feeble, if any change fuller. Urine of acid reaction, containing a small quantity of albumen, normal amount of chloride, great excess of urates; phosphates, if at all changed, are diminished; tube-casts somewhat granular and coated with epithelial cells. Took 1 oz. whiskey at 10 A. M.; pulse 148, still feeble; body covered with moisture; breathing still very rapid and shallow; some impairment of resonance at back of right lung, with a few coarse râles; no bronchial breathing; mind, if anything, duller; face flushed; whiskey continued ℥ij every two hours, with 4 grs. quinia every two hours, and also a mixture of chloroform and alcohol. In the afternoon pulse 152 to 156; no change in breathing, still very frequent and noisy, is perhaps fuller than in morning; the same slight impairment of resonance over back of right lung, with a few coarse râles; no bronchial breathing; mind duller; face flushed, covered with sweat. In the night breathing somewhat more difficult, still very feeble; is gradually growing worse; pulse still about 152; whiskey was diminished to see if the pulse would fall, but there was no marked change; returned to her former allowance.

19*th*. A. M., 4½ o'clock, died.

Autopsy thirty hours after death.—Subject very fat. *Blood* dark colour; utter want of clot; deficient in fibrin and in red globules. *Brain* normal consistence; membranes congested; veins filled with dark blood; no appearance of an effusion into the ventricles or any other part of brain; brain structure everywhere healthy. *Lungs*, no sign of exudation at base; congested; back of right lung is more heavily congested than any other part, though lower lobes of both lungs markedly congested; portion of right lung sinks imperfectly in water, but is readily inflated, showing only congestion and some collapse; no exudation. *Heart* average size, but softer than normal; softening not found to be associated with any microscopical changes; fibres very well marked. *Spleen* enlarged, and darker hue than normal. *Liver*, nutmeg liver, congested, and slightly fatty. *Kidneys* larger than normal; tubular structure intensely congested. *Intestines* healthy; no disease of Peyer's gland; may be some congestion, and very slight prominence.

The very rapid feeble pulse, the great prostration scarcely influenced by the most active stimulation, the mind so clear at first, then becoming very dull, and the heightened noisy breathing gave to this case striking features. The peculiar condition of the respiration can certainly not be solely accounted for by any changes in the lungs. It is more purely a nervous phenomenon occurring in patients whose nervous systems have been overwhelmed by the fever poison. It may be a question whether the congestion of the lung sometimes associated do not become combined with collapse (as in Case V.), and thus the noisy breathing be explained. But if it be so, what causes the collapse? Certainly not the extent of secretion, which is slight; much more likely the enfeebled nervous forces. A further question suggesting itself is whether the presence of albumen in the urine of the last two cases be more than a mere coincidence; whether the impeded secretion of the kidneys likely to have been occasioned did not react upon the already enfeebled nervous centres, and thus give rise, or at least aid in giving rise, to the altered breathing? Another example of this kind of noisy breathing is afforded by a case further on reported (Case IX.), in which the kidneys were considerably affected, in which retention of urine happened, and in which, though there was pneumonia, the state of the lungs could not by itself explain the character of the breathing.

Urinary Secretion.—The urine was found to vary much in quantity and colour in the observations that were made. It is high coloured at first, but may become quite pale as convalescence begins, depositing an abundance of urates and phosphates. In several cases, far advanced in the fever, it was retained. In no case did its specific gravity reach above 1023; while 1014 to 1017 were much more common; 1010 was the lowest noted. As a rule, it preserved its acid reaction; but in several cases it was neutral, and in a few it was alkaline, or at least became so within twelve hours after it was voided. In most of the cases the chlorides were entirely absent or reduced to a trace; in some they remained normal; and in one they were plentiful throughout. During convalescence they return, but the specific gravity does not of necessity rise; it may even fall during their reappearance.

Albumen was detected in 8 out of 21 cases in which the urine was examined daily, or nearly daily, for this ingredient; but in one of these cases it may have been owing to previous renal disease; in another it was only discovered in one examination, and was a mere trace; in none was it really very abundant. The cases in which it was met with, with perhaps one exception, in which the most minute quantity was present, were severe cases, and among the eight cases there were four deaths, or, if we reject the case alluded to where it is probable that the kidneys were previously affected, three in seven cases proved fatal. But it cannot be said that in those exhibiting albuminous urine any very special prominence of delirium or stupor was observed. Yet I do not doubt that when the quantity of

albumen is large, and the secreting power of the kidneys much disturbed, that the want of power of elimination on the part of these important organs still further vitiates the blood and may show itself by more marked stupor or coma, by increased delirium, or even by convulsions, and under any circumstances the existence of albumen proves the blood to be considerably disordered, and must be taken into account in explaining the phenomena of a case and in determining its treatment.

Along with the albumen, and in repeated instances without it, tube-casts were found; the microscope also exhibited renal as well as vesical epithelium in the deposit with some of the salts of the urine. The tube-casts were in marked cases of the disease more often present than absent. They were either coated with rather opaque epithelial cells, many of which were finely granular, or were hyaline, or covered with granules, which, as Dr. Pepper, who tested them with reagents, informs me, were sparingly soluble in acetic acid, and which, with very high magnifying powers, did not present the round shape of oil. They are probably the urinary salts collected on the tube-casts, which themselves are an indication of the altered blood, and of the congestion and disturbed nutrition of the kidneys.

The extreme and early *loss of strength* is a very constant and characteristic feature of the malady. In some instances the patient was able to drag himself to the hospital, though he had reached the fifth day of the fever; but, as a rule, those admitted, even when they had been ill but a few days, could scarcely walk, and had been obliged to keep their beds from the first manifestations of the disease. The extreme debility persists throughout the complaint; and though it is not uncommon to find the patient very restless, and attempting to get out of bed, yet any appearance of strength he may show is fictitious, for, left to himself, he is very apt to fall to the ground, or to stagger back to and sink exhausted on his bed.

The loss of strength is generally greatest in those who exhibit marked tremulousness of the hands, or indeed of any part of the body. Sometimes the prostration may increase so rapidly as to lead to complete collapse.

CASE VI. *Typhus fever; delirium; sudden collapse, with huskiness of voice, similar to cholera; death.*—Edward L., æt. 25, admitted into the hospital April 10, 1865. Born in Philadelphia. After leaving college, at the age of 19, went to sea, and has served as supercargo on numerous long voyages. Two months ago a slight hacking cough commenced. He has had a chancre, followed by bubo in left groin, but has never noticed any secondary symptoms. His present attack came on five days ago with fever, headache, vomiting and purging, sore throat, and a diffuse papular eruption. The papules, he states, became vesicular, desiccated, and desquamated. But the preceding lines are all very doubtful, as he was far from being rational.

April 11. His eyes, which were slightly injected yesterday, are markedly so to-day. Tongue clean. Complains of frontal pain, but seems rational, save that he frequently expresses a desire to be buried in sand, to cure a diarrhœa which he says he has. There is an eruption visible on the chest

and abdomen; some of the spots being much modified by pressure, whilst others were hardly at all influenced; some spots were also seen on the arms, feet, and legs, but not so many as on the chest and abdomen. There is slight muscular tremour. Skin warm, but not hot. Belly meteoric. Pupils of moderate size; react to light, though not very actively. There are râles, dry and moist, none very fine, over back of lungs, but scarcely so many as when admitted. Some râles, with jerking, prolonged expiration, under right clavicle, and percussion note is less resonant there than under left. Heart-sounds normal as regards murmurs, but first sound is deficient. Pulse 120, and feeble. No vomiting. Bowels have not been opened since admission into hospital. Ordered liq. ammoniæ acet., aquæ camphoræ, āā f℥ss every fourth hour; beef-tea f℥ij every second hour; and a few ounces of whiskey in the shape of milk-punch.

P. M. Inability to void urine, which was drawn off; sp. gr. 1019; good quantity of chlorides; albumen in small amount, merely causing an opalescence; deposit contained granular epithelial casts, phosphates, with refracting granules. Some whiskey given during night, and beef-tea.

12*th*, 7 A.M. Found him in state of partial collapse. Hands blue and cold. Radial pulse scarcely to be felt. Tremulous movement of lower jaw, with a peculiar hoarseness or huskiness of voice, like the vox cholerica. Bowels have not been opened. External heat and stimulating frictions were immediately applied, and f℥iss whiskey given every hour until 10 A. M.; after that he took f℥j every hour, one hour with f℥j milk, the next with f℥ij beef-tea. No reaction, however, occurred. The eruption became much more copious. The urine, which was drawn off, was of sp. gr. 1013; chlorides almost absent; no albumen; but same microscopical appearances. The extremities remained cold, despite most powerful frictions and stimulation. Ordered f℥xxiv whiskey daily, and f℥j sp. chloroformi every second hour. Bowels were not opened. Belly meteoric; no gurgling, but he seemed to feel pain in iliac fossa. Huskiness of voice increased. Mind grew more and more heavy, and patient difficult to rouse. He died at 3 A. M., April 13; surface becoming very cold some time before death.

Autopsy seven hours after death.—Considerable cadaveric rigidity. Body much emaciated.

Thorax.—Lungs crepitant throughout, but deeply congested in lower lobes posteriorly. Heart healthy; contained small soft black clots. There were firm adhesions of pleural surfaces, especially on right side.

Abdomen.—Very little fat. *Liver* enlarged, congested, perhaps a little more fat than normal. *Spleen* very much enlarged, about thrice normal size; not very pulpy; containing no abnormal nuclei. *Intestines* presented some prominence of Peyer's glands, and congestion of mucous membrane, but no ulceration. The mesenteric glands were but slightly enlarged. *Kidneys* congested, with some tubes filled with granular epithelium and masses of granular urates.

Brain was healthy, not even congested. It was thought that the olfactory nerve was rather tough.

Blood was collected from right iliac vein, consisting of soft black clots and of fluid dark blood. The clots had numerous little white points on their surface, which proved to be aggregations of white corpuscles. The fluid blood contained *patches* of white corpuscles, which, when treated by acetic acid, cleared up, showing one, two, three, or four nuclei.

Headache is a symptom rarely absent. It is found among the pro-

dromes of the fever, or exists during the early period. It is referred either to the forehead or the back of the head. In not a single instance was it noted to have been acute or paroxysmal; and very rarely, indeed, is it intense, or more than a continuous dull aching. It does not last throughout the fever, and only during the first week of the malady does it form a distinct feature of the disease, or is apt to be complained of.

As in most epidemics of typhus, so in this, the mind is more or less affected, and *stupor* and *delirium* are common. But in a large number of cases the stupor is not very decided; there is rather sluggishness of mind, and at no time does the patient, when aroused, fail to give a correct and connected answer. Of 24 cases, in which the state of the mind was specially noted, there existed delirium in 10; in 8 dulness of mind and stupor were prominent symptoms; in the remaining 6 the mind was not confused, but remained clear, although perhaps not so active as in health. The *delirium* is generally quiet, more often muttering than active or noisy. In 4 of the 10 cases it was combined with great restlessness, and in one of these—and all were severe, though none fatal—the patient was delirious, talked and screamed, and tried so persistently to get out of bed that bandages had to be used to restrain her; in another the mental wandering was attended with very great restlessness at night, in fact with utter sleeplessness; in the third the patient moved about a great deal in bed, and once or twice left it; and it was much the same in the fourth. Sometimes the mental state and the character of the wandering are very peculiar. The extraordinary delirium of Case VI., who gave a very detailed and connected account of the symptoms prior to his illness, which undoubtedly was utterly incorrect, and whose real mental condition revealed itself by the constantly expressed wish to be buried in the sand, for the cure of a diarrhœa which did not exist, has already been mentioned. In another patient the mind appeared clear and the intelligence good; she seemed to have a perfect cognizance of her condition, answered any questions rationally, but, as evening came on, became restless, got out of bed, and was in a state of intense nervous excitement, expressing herself as having committed sins which could not be pardoned, descanting on the general consequences of sin, and the Almighty's mercy. These hallucinations occurred two nights in succession.

The delirium was in only one case, and that a somewhat doubtful one, noticed at the very beginning of the malady. It generally comes on in the second week, as the headache passes off. It is not in itself a dangerous symptom. It was present in 3 of 5 fatal cases; in 1 the delirium was muttering, associated with stupor gradually deepening into coma; in 1 the delirium, too, was muttering, but the patient was still capable of being aroused on the morning of the day he died; and in 1, a case (Case VI.) just described, the peculiar state of mind continued until collapse occurred.

In the remaining 2 of the fatal cases the mind was dull and stupid in one; the other one presented the extraordinary phenomenon of its remaining clear to the last hours of life.

CASE VII. *Typhus fever, with great prostration; mind remains clear; hiccough; husky voice; death.*—William W., coloured, a sailor, æt. 35, admitted into the Pennsylvania Hospital, April 10, 1865. No history could be obtained, excepting from the answers he himself could make. According to his own account, he had suffered for eight days from pain, cough, diarrhœa, and anorexia.

April 11. Suffusion of both eyes, with small pupils; bowels freely opened six times daily; tongue coated, dryish; pain in stomach, which is meteoric; mind clear, though sluggish; pulse 120, feeble; constant hiccough. He was freely nourished and stimulated from the first, taking beef-tea f℥ij every two hours, and f℥xij whiskey. He was also placed upon acid. nitromuriatic. gtt. vj in aq. camphoræ f℥ss every four hours.

12*th.* Last night, finding the hiccough continue, an opium suppository of gr. j was introduced, and he was put upon the use of chloroform gtt. v every two hours. This morning he still hiccoughs, though less than before the suppository and chloroform were given. Pulse is small, 124; tongue dry in centre, and coated; skin less hot; bowels six times opened since yesterday. Urine had to be drawn off, and was found to be of sp. gr. 1023, acid reaction, chlorides almost absent, and with a decided, though small amount of albumen; it was of high colour, and deposited granular and hyaline casts, and granular epithelium. Towards night, as the hiccough obstinately persisted, ol. succini gtt. v every three hours was ordered; the whiskey was increased to f℥xviij daily.

13*th.* Tongue slightly coated, moist, and very tremulous. Hiccough continues, but less violent, and apparently somewhat influenced by treatment. He has had three passages since last night, one involuntary this morning. Urine still requires to be drawn off by catheter, and is of sp. gr. 1020, high colour, acid reaction, chlorides very deficient, and a small amount of albumen. Pulse 144, very small and feeble. Extremities very cold. Ordered quiniæ sulph. gr. xvj in divided doses, and increased whiskey to f℥xxiv.

14*th.* Rapidly sinking. Constant tremulous movement of lower jaw and tongue. Hiccough has almost ceased. Eyes are fixed, with but little expression, and yet mind seems clear, although he appears nearly in articulo mortis. Involuntary discharges both of urine and a thin yellow fecal matter. Pulse extremely feeble, and too rapid to count. Respiration very rapid and shallow. Abdomen meteoric. Extremities as cold as if he were dead. Towards evening vomiting came on. For past 48 hours there has been a peculiar huskiness of the voice, which increased so long as he was able to articulate. These ominous symptoms aggravated through the night, the intense coldness of extremities advanced towards trunk, the pulse grew more and more thready and rapid, deglutition became impossible, and at 12 M., April 15, he died.

Post-mortem examination five hours after death.—Marked cadaveric rigidity. Body not much emaciated, though features were singularly pinched.

Head.—No congestion of vessels of scalp or calvaria. The large veins over convexity of brain filled with dark blood. Brain substance apparently healthy. No abnormal effusion into ventricles, nor thickening of membranes.

Thorax.—*Lungs* were crepitant throughout; much congested in posterior part of lower lobes. *Heart* of good consistence; contained several clots, those in auricles being soft and dark, whilst in left ventricle there was a tough, very irregular, fibrinous clot.

Abdomen.—*Liver* somewhat enlarged and congested; when examined under microscope, the cells were found to have preserved their nuclei in every case, and contained no excessive amount of fat. There were firm adhesions between convex surface of liver and under surface of diaphragm. *Stomach* was of average size; exhibited a somewhat thickened condition of its walls, especially the mucous surface, and a marked enlargement of the villous coat towards cardiac extremity. *Spleen* was about half as large again as in health, dark, and soft. *Kidneys* were of normal size, somewhat congested, and in one or two parts presented a decided decrease of the tubular portion. When examined minutely, the Malpighian bodies and capillaries were found to be only moderately congested; but the epithelium contained an abnormal amount of granular fat, and in places the tubes were clogged with granules. *Intestines.*—Considerable dark congestion of colon; congestion of lower portion of small intestine; with enlargement of solitary glands, and congestion, though not tumefaction, of many of Peyer's patches.

The *blood* was dark, either fluid or forming soft dark clots; contained an abnormal number of granular corpuscles, which, when treated by acetic acid, revealed from one to four nuclei. The red corpuscles were crenated, and did not form themselves properly into rolls.

Irrespective of the singular state of mind of this patient, the hiccough requires to be noticed. This is a very rare symptom in typhus fever, and generally happens only in the gravest examples of the disorder. But it is doubtful whether it can in this case be attributed to the febrile malady. To say the least, the organic disease of the stomach and the adherent diaphragm, neither of which appeared recent, acted as predisposing causes.

Deafness was noticed to exist, to a greater or less degree, in 8 out of 21 cases, 2 of which proved fatal. It may or may not be connected with buzzing in the ears. It could not have been, as has been suggested with reference to the occurrence of this symptom, due to quinia, since, at the time it was observed, the patients were not taking this medicine. In 5 of the 8 cases there was coexisting delirium; of the other 3 the mind was sluggish in 1, very dull (and the deafness in this case was very great) in 1, and in 1 it was little if at all affected, though here, too, the deafness was very marked.

Epistaxis is scarcely regarded as a symptom of typhus fever. Most writers barely allude to it as among the possible signs of the malady; few have met with it. Yet in this epidemic it occurs in about one-fourth of the cases, the same proportion in which Jacquot encountered it during the Crimean war. I have noted it in 8 of 31 cases. In only one was it profuse. It took place in all excepting one during the earlier part of the disease, though in one it recurred almost to the end. In 1 it lasted during one day, and the blood came from both nostrils; in 2 the nose bled repeat-

edly, and at intervals of several days. The cases in which it was found were the graver ones. In 6 of the 8 there was also diarrhœa.

The frequency of epistaxis is all the more remarkable from the rarity with which other hemorrhages happen. I have not as yet seen a single instance of hemorrhage from the bowels or the gums. Nay, even sordes on the teeth and lips, due as they so often are to slight admixture of blood with the cast-off epithelium, were not unusually common.

Complications.—The most ordinary complications observed in this epidemic are *pneumonia, erysipelas,* and *parotid swellings;* others, too, occur, such as *pharyngitis* and *gangrene of the feet,*[1] but these were met with but in single instances, while several of the former were encountered.

True pneumonia was seen in 3 out of 32 cases. In two of these it was limited to the posterior lobe of one lung, and there was coexisting bronchitis of the other; in the third case it was double, or to speak more accurately, it affected, as true lobar pneumonia, one lung, while the other showed only signs of partial consolidation, with marked hypostatic congestion and bronchitis.

CASE VIII. *Typhus fever complicated with double pneumonia; recovery.*—Mary T., mulatto, æt. thirteen, the daughter of a man who had just left the hospital convalescent from typhus, was admitted on March 3d, 1865. She was taken sick, February 24th, with headache, pain in breast, diarrhœa, bad taste in the mouth, and anorexia. When admitted, on the seventh day of her illness, her symptoms were: headache, but no pains in the limbs; great heat of skin; six to eight watery discharges from the bowels; tongue coated with a whitish coat; flush on both cheeks perceptible through the dark skin; injected eyes; slight cough; pulse 118, and rather feeble. Was ordered plumbi acetat. gr. ij, every sixth hour; beef-tea six oz., and milk freely.

March 5. Tongue still coated; diarrhœa better, only two passages last twenty-four hours. 7 P. M., pulse 128; continue pills.

6*th.* Pulse 132; no passage since yesterday morning; tongue coated, but less so; restless, almost sleepless night; eyes not so suffused or injected. Two oz. of whiskey daily, added to her milk diet.

7*th.* Pulse 136; coughs a little; one passage since yesterday morning; skin cool; mind wanders; tongue still slightly coated, yellowish-white, substance unaltered, perhaps redder than usual. Urine sp. gr. 1020, acid reaction, the merest trace of albumen, more perceptible with nitric acid and heat than with nitric acid alone or heat alone. Ordered whiskey increased to 4 oz. daily; acetate of lead pills stopped; ol. terebinth. gtt. x every fourth hour.

8*th.* Complains of much pain on pressure in the right iliac fossa; bowels not opened for two days; 9 A. M. pulse 140, feeble; 6 P. M. pulse 144.

9*th.* Mottled spots, some darker than others, found principally on chest and abdomen, little, if at all, influenced by pressure. General abdominal tenderness, but tenderness more marked perhaps in the right iliac fossa; tongue clean; delirious during the night, but better this morning; pulse

[1] Case for which amputation of the leg was performed at the Pennsylvania Hospital, and described by Dr. Andrews in July number of this Journal, 1864.

124. Ordered poultices medicated with laudanum to be applied to abdomen; whiskey increased to ℥vj; turpentine continued.

10*th*. Pulse 112; bowels opened twice by a teaspoonful of castor oil; sleeps well; tongue cleaning; less pain in abdomen; flush visible on cheeks; cough, which has been slight all along, is now marked; tenacious, but not rusty-colored expectoration; the respirations have become frequent, 40 to 42, and there is great dulness with tubular breathing on right side posteriorly, no dulness anteriorly; fine crepitation at the back of left lung; left cheek seems most flushed; tongue moist, losing its coat. Ordered, in addition to previous treatment, quin. sulphat. gr. ij four times daily in a mixture of spir. eth. nitr. and syrup prun. Virg.

11*th*. Pulse 111; respiration 48; percussion dulness still marked on right side; distinct tubular respiration; vocal fremitus increased on right side; fine crepitation still heard on left side; urine of dark amber colour, acid reaction, sp. gr. 1022, no albumen, a slight diminution of the chlorides. Ordered turpentine stupes and poultices to be used; continue whiskey six oz. daily in milk, and beef-tea.

12*th*. Pulse 112 to 118; respiration 46 to 48; only slight impairment of resonance on left side, with some crepitation and imperfect blowing respiration. On the right side crepitation is now becoming rather coarse, and tubular breathing less well defined; flush on left cheek is still more distinct than on right; complains of pain on pressure on right side of abdomen; mind clear; tongue clean and moist, yellowish-white coat.

13*th*. Pulse 104; respiration 36 to 40; tubular breathing losing its distinctness; râles increasing, somewhat coarser in right lung; sputum adherent, but not rusty-coloured, and in small quantities.

14*th*. Pulse 102; respiration 26 to 28; tubular respiration losing its distinctive character; sputum tenacious, rather thicker than yesterday.

16*th*. Pulse 104; respiration 28; dulness very much disappeared; breathing lost its tubular sound; sputum less tenacious, and is more copious.

17*th*. Pulse 88; respiration 28 to 30; only slight impairment of resonance still perceptible at lower portion of left lung and middle of right; few coarse moist râles with vesiculo-bronchial respiration on right side; no tubular breathing; flush on cheek disappeared; cough diminishing.

19*th*. Pulse 108; tongue still slightly coated, but patient is convalescing.

21*st*. Pulse 104. Reduce whiskey to two oz. daily.

22*d*. Pulse 96; respiration becoming more and more vesicular and normal; strength increasing.

30*th*. Discharged well.

In this case the inflammation of the lung succeeded gradually to the hypostatic congestion. The pulse remained for some time, and probably as the exudation was taking place, at upwards of 140; this phenomenon was equally observed in another patient, a girl of ten years of age, treated too with quinia and turpentine, and in whom recovery also took place. The same fortunate result did not happen in the following case, a man of fifty, but who, in addition to the pulmonary complication, had previously existing disease of the heart and kidneys.

CASE IX. *Typhus fever; diarrhœa; pneumonia of one lung; bronchitis and congestion of other; noisy breathing; retention of urine; death.* —George L., æt. 50, admitted April 11, 1865. Born in Bucks County, Pa.

Seaman. Has been dull and feeble for a week, with some frontal pain and general soreness; anorexia; bowels opened twice daily; had a decided rigor about a week ago; coughed occasionally, with mucous expectoration; no epistaxis; a little pain in abdomen.

April 12. Tongue dryish, with very light fur; papillæ prominent and distinct. Pulse 120, of fair volume, but compressible. Eyes suffused, with small pupils. Belly large and meteoric. Bowels opened three times during night; thin passages. Mind perfectly clear. Considerable cough. Eruption on abdomen. Treatment, acid. nitro-muriatic. gtt. vj every fourth hour. Beef-tea and milk-punch.

13*th*. Eruption over chest and abdomen; a few doubtful points on arms; some on legs. Those of lightest red are very much modified by pressure; they appear coarser and larger than typhus fever eruption ordinarily is. Bowels loose; two or three passages during night. Cough, with few bronchial moist râles on left side. No dulness on percussion. Tongue moist and slightly coated. Pulse 120.

14*th*. Pulse at least 120; intermittent. Respiration 36. Tongue coated and dry in centre; rather moist toward edges. Bowels opened twice; small, thin passages. Urine free; sp. gr. 1015, acid, deficient chlorides, considerable albumen, blood, granular epithelium, crystalline casts, with few tube casts. Eyes suffused; pupils small. Belly large but supple; eruption as before. Coughs considerably, with mucous expectoration. Excessive feebleness of heart's action. Pulse irregular in rhythm, occasionally dropping a beat, and the beats varying in duration. Coarse, moist râles over left side anteriorly, and posteriorly low down. Harsh blowing, but not true tubular; breathing heard over right scapula. Ordered quiniæ sulph. gr. xvj daily in two-grain doses. Whiskey f℥xviij. Beef-tea and milk continued.

15*th*. Delirious; muttering, but readily roused, and, when questioned, answers correctly. Tongue moist. Pulse 122; very compressible. Some dulness of hearing. Belly large and supple. Eruption same. Bowels opened four times; stools of mush-like consistence.

16*th*. Passed a restless night. Respirations 40. Pulse 130. Tongue moist at tip; brown and dry in centre. Considerable muscular tremor, and constant trembling of lower jaw. Bowels opened once, not a formed stool. Retention of urine; when drawn, is of sp. gr. 1015, alkaline, deficient chlorides, considerable albumen, fragments of casts. Dulness on percussion posteriorly on right side, and harsh blowing respiration mixed with large râles. A good deal of cough with tenacious sputum. Eruption same. Toward night he became much worse. Deglutition was impossible. Pulse very rapid and full. Retention of urine continued. Respiration laboured, noisy inspiration, with puffing expiration. Urine drawn off. Ordered beef-tea and one ounce of whiskey by enema every two hours.

17*th*. Condition unchanged. Is too weak to discover condition of lungs. Has had one passage from bowels, and passed some urine at same time, but about f℥x were drawn off. Unable to protrude tongue. Pulse very feeble—over 130. Belly large and supple. Respiration 45, with same characters as last night. Skin only moderately warm. Entirely unable to speak, but looks at you when spoken to. Ordered beef-tea and whiskey continued; quinia gr. vj every six hours; also beef-tea f℥ij, yelk of one egg, f℥iss whiskey every three hours by enemata. Died at 12 M.

Autopsy.—Blood diffluent; numerous white corpuscles.

Heart dilated; fibres pale, granular, and friable, with abundance of free fat.

Lungs. The posterior part of right lung was dense, and it was found to sink in water. Left lung congested but not consolidated.

Kidneys large; somewhat congested; cortical portion much increased; very granular casts in tubules.

Intestine showed congestion of colon, and prominence of the solitary glands, with some congestion and prominence of Peyer's patches, but not the least appearance of deposit or ulceration.

Erysipelas is a serious, but not necessarily fatal complication. In none of the cases observed did it occur excepting on the face. It appeared as the fever was approaching its termination, or even after commencing convalescence.

CASE X. *Typhus fever, complicated with erysipelas; repeated epistaxis; parotid swelling; death.* — John C., æt. 23, admitted into the hospital April 1, 1865. Seaman; made his last voyage from Liverpool to New York; came directly to this city after landing. About two weeks ago, while boarding in a house in Pine Street, was, to use his own language, on a drunken spree, and while recovering, felt the prodromes of the present attack—languor, headache, &c. Since that time he has been confined to bed. Has had considerable diarrhœa (ten stools daily); repeated epistaxis, principally from right nostril; total anorexia; great prostration; frontal headache; vomiting about a week ago. The stools have been very fluid and offensive.

Condition shortly after admission: Tongue moist and clean; skin hot; countenance dull, with congestion of both eyes; answers are slow but correct; slight deafness. Pulse 114, feeble. Respirations accelerated. Cough, with mucous expectoration, and with fine râles over lower posterior part of both lungs. There are a number of spots over surface, some of which he ascribes to an attack of scabies which he had some time since.

April 2. In the same condition. Has had two stools, dark and consistent. Respiration 18. Pulse 108. Coughs considerably. Eruption is a coarser red, not much influenced by pressure, and most abundant on abdomen. Has taken beef-tea and milk-punch, āā f℥ij every fourth hour. Quiniæ sulph. gr. viij daily.

3*d.* Intelligence about the same. Eyes still congested; pupils small. Respirations heavy, 20 in the minute. Pulse compressible, 112. Tongue clean but dry; some sordes on lips. Has had quite a free epistaxis this morning. Eruption same as yesterday. Much less cough. Bowels opened once; stool feculent, rather soft, and light-coloured. Urine sp. gr. 1011, acid, no albumen; deposit of premature epithelium and a few mucous corpuscles.

4*th.* Pulse 114. Tongue coated and dryish. Eye still congested. Eruption the same. Bowels opened twice during night. Pupils small. Occasional cough, and fine, dry râles at postero-inferior part of lungs.

5*th.* Pulse 120; rather feeble when sitting up. Bowels opened frequently and copiously. Tongue dry and coated. Mind tolerably clear. Eye still suffused. Eruption still very visible. The same amount of whiskey, ℥viij to ℥x daily in milk; beef-tea and quinia continued.

6*th.* Dull and drowsy. Skin less hot. No more epistaxis. Pulse 112, compressible. No subsultus. Eyes suffused, but less injected. Tongue very dry; black crusts in centre. Sordes on lips. Rare cough. Belly normal. Eruption same. Bowels open three times during night, once this morning.

There are a few dry and moist râles over posterior part of left lung below ridge of scapula. One of cervical glands at right angle of jaw is swollen. Urine, sp. gr. 1012; chlorides almost absent; no albumen; light flocculent deposit.

7*th*. Much the same. Still dull and stupid. Pulse 108, of deficient volume. About four passages in twenty-four hours.

9*th*. Heavy and drowsy. Tongue moist and well-shaped. Bowels opened three or four times during night. Pulse 100. Eyes less congested. Stop acid, and give tr. terebinth. gtt. x every fourth hour in mucilage. Skin moderately warm. Urine free. The small abscess at right angle of jaw has opened and discharged freely. Ordered tr. opii gtt. xxx by injection late in day. Discharge from left ear.

10*th*. Eye almost clear; pupil small. Tongue dry. Respiration 22. Pulse 108, large, but quite compressible. Skin moderately warm and moist. Bowels opened about twice during night, passages being watery, with normal-coloured fluid feces. Little cough. He has been occasionally delirious since yesterday morning, and is very dull. Lungs are full of snoring and cooing dry râles, and large moist râles. Turpentine stupes; tr. opii gtt. xxx by injection.

11*th*. Dorsal decubitus. Face rather pinched. Eyes sunken; conjunctivæ clear; pupils rather small. Skin inclining to be cool. Tongue dry and glazed. Pulse 108, large, but compressible. Slight dulness of hearing. Belly meteoric. Bowels less frequently opened; ochre-coloured fluid stools. Lungs less full of râles.

12*th*. Less hebetude and deafness. Tongue not so dry and coated. Eye clearer. Belly still meteoric. Bowels are freely opened. Skin pleasantly warm. Coughs considerably, but rather less. Pulse 108, of good volume, and more force. Slight purulent discharge from left ear. He has vomited occasionally in last few days. Urine, sp. gr. 1017, no chlorides, decided albumen. Free fat, granular epithelium, hyaline tube-casts, and entirely granular casts.

13*th*. Bedsore forming over sacrum. A large external pile has also appeared. Bowels freely opened three times during night. Tongue moist and clammy; quite clean; sordes. Belly flat; no gurgling or tenderness. Pulse 96, compressible. An erysipelatous blush has appeared over bridge of nose extends to malar bone on each side, with some tumefaction. Still coughs. Mind dull, but not restless or delirious. Urine of last night sp. gr. 1013, alkaline, chlorides almost absent, no albumen, pale amber, globular urates, and triple phosphates. Increase whiskey to f℥xviij. Apply sulphite of soda locally—solution of gr. xv to f℥j aquæ Give turpentine every three hours. 12 grs. quinia daily. Towards night he vomited occasionally.

14*th*. It is with difficulty that the application can be kept in place on his face, but it has been renewed constantly. Erysipelatous redness and swelling have extended about an inch in every direction. Bowels opened four times, passages being thin. Skin cool. Pulse 105.

15*th*. Tongue glazed and dryish. Skin moderately warm and dry. Pulse 105, large, but compressible. Bowels opened five or six times very copiously. Erysipelas has not extended on left side of face, but on right side it has advanced to ear, and there is also hard swelling of right parotid. Argent. nitrat. gr. x to f℥j to part.

16*th*. Another attack of epistaxis. Bowels opened five times; passages but moderately thin. Belly meteoric. Tongue soft, with patches of white

coat. Eyes clear. Hearing very dull. Pulse 108, of fair force. Right parotid very much enlarged. Some puffiness over left angle of jaw.

17*th*. Bowels opened several times. Urine free. Gums not spongy; no salivation. Perfectly deaf, but intelligence seems good. Eyes brighter. Tongue clean—merely dryish. Belly scaphoid. But little cough. Pulse 108, fair volume and force. Swelling at angle of jaw increased; tense and elastic; no signs of fluctuation.

18*th*. Intelligence good, although he is very drowsy. Tongue clean and moist. Pulse 96. Belly flat. No passage since early morning. Right parotid still very large; somewhat elastic, but not very hard. Right ear discharging freely. No enlargement of left parotid. Right parotid is even less hard than yesterday. Fomentations applied, but not steadily kept up. Erysipelatous redness is much less distinct.

19*th*. Less deafness; intelligence good. Tongue clean and soft. Pulse 104, gaining strength. Skin moderately warm. Bowels freely opened. Erysipelas almost gone. No desquamation yet. Right parotid much less hard in front of ear. Discharge from ear continuing. Respiration noisy; at one time only 15 in minute; entirely through his nose. Bedsore over sacrum.

20*th*. Pulse 130; small and feeble. Considerable vomiting. Bowels freely opened three times. Skin moderately warm. Belly retracted. Eyes clear. Very great deafness. Free discharge from right ear. Right parotid less tense. Tongue dry; somewhat glazed. Vomiting ceased toward night. Stop turpentine. Erysipelas returning. Ordered ferri perchloridi gr. $\frac{1}{4}$, every second hour; other treatment continued.

21*st*. The night-nurse reports that he has had no vomiting. Has taken his stimulus and medicines well, but at 8 A. M. he appeared to suddenly fail. His countenance was nearly hippocratic. Pulse very small, 132 in minute. Hands cool and clammy, although remainder of surface was warm and dry. Bowels thrice opened; small, thin passages. Belly scaphoid. Right parotid much diminished in size, discharge from ear continuing. Last night he got out of bed, climbed on table, and fell violently on floor. He steadily sank after this, and died at 10 A. M.

Autopsy six hours after death. — *Brain* healthy. *Thorax.* Lungs deeply congested postero-inferiorly, especially on right side. No pleuritic adhesions nor effusion.

Liver large, very pale, with yellowish tinge, and on examination, cells found to be very fatty. *Spleen* but slightly enlarged and quite firm.

Kidneys pale, and, when examined, some tubes were seen, with their epithelium, cloudy and granular, though the majority were typically healthy.

Intestines. Some congestion of large bowel; in small intestine, Peyer's patches were rather prominent, and there was some enlargement of the solitary glands, but not the least irregularity or sign of ulceration. The mesenteric glands were considerably enlarged, pale and firm.

Blood was dark and fluid; contained about three times as many white corpuscles as in health, which inclosed two and three nuclei. The red corpuscles were evidently unhealthy, as there was no perfect formation of rolls, and the colouring matter was too easily dissolved out by water. The bladder contained a considerable amount of urine, which was amber-coloured.

Upon laying open seat of parotid, it was found that the gland had suppurated, discharging itself through ear.

In this case the erysipelas was associated with *parotid swelling*, itself a not unfrequent and a dangerous complication of the fever. This complica-

tion happened in 5 out of 50 cases, two of which died. In one it affected merely one gland, in four, both. The former case recovered; and so did two of the latter. In one of these, a boy, 14 years of age (R. B.), the swelling was enormous. It appeared, as indeed these swellings usually do, just as the fever had begun to decline. Various local means were tried to backen the tumefaction, or cause its absorption—iodine, belladonna, mercurial ointment, a freezing mixture—but all in vain, they had no effect. The glands both suppurated; and suppuration was favoured by fomentations and poultices. The first discharge came through the ears, and the glands were subsequently opened. The following is a similar instance:—

CASE XI. *Typhus fever with parotid swelling; absence of chlorides from the urine; recovery.*—Sallie McG., æt. 7, living in a neighbourhood from which numerous cases of typhus fever have been brought to the hospital, was admitted April 3d, 1865. Imperfect history only could be obtained; has been sick about nine days (according to her sister's account she was only sick for two days, then grew much better, was up, and relapsed). She now presents: sordes on teeth; eyes suffused and watery, slightly injected; tongue dryish, imperfect yellow coat; skin moderately hot; pulse 120; bowels inclined to be loose; mind quite clear; eruption general, not very distinct. Ordered acid. nitro-muriatic. gtt. iij every fourth hour. Ol. terebinth. gtt. v every fourth hour, beef-tea, and milk.

April 4. Dull; cheeks flushed; eyes slightly injected; tongue moister; bowels costive; pulse 120; eruption indistinct; urine sp. gr. 1015, acid, no albumen, chlorides absent, no deposit.

5*th*. Brighter; eyes less injected; tongue becoming moist; urine retained for twenty-four hours, sp. gr. 1016, acid, chlorides absent, no albumen.

6*th*. Brighter; eyes scarcely injected; tongue moist, slightly coated; urine passed freely; bowels costive; pulse 104, gaining strength; good appetite. There is no hepatization of lung to account for absence of chlorides; she has an occasional hoarse cough, which is apparently tracheal.

7*th*. Cries a great deal, owing to an inflammation of the gland near right angle of jaw; passed an uneasy night; has had an ounce of oil, but bowels have not been opened; tongue well shaped, moist and clear at edges and tip, coated in centre; passes water freely, and drinks a great deal of water; appetite poor; sordes on teeth and lips; pulse 120, small, but of good force; respiration 22 to 24; no blowing respiration, breathing can scarcely even be called harsh; percussion note clear. 8 P. M. The swelling at angle of right jaw has involved right parotid, anterior part of neck, and glands at left angle. Urine sp. gr. 1014, neutral, no albumen, normal colour. Ordered acid stopped, quiniæ sulph. gr. v daily, sol. argenti nitrat. gr. x to f℥j applied locally.

8*th*. This morning the swelling seemed a little less, but toward night it has increased; pulse 124; tongue slightly coated; bowels opened; child less restless, but still cries a great deal; urine neutral, sp. gr. 1014, chlorides returning, but urine merely rendered opalescent, no albumen, normal colour.

9*th*. Passed a better night, but is restless again this morning; tongue moist with white fur in patches; pulse 95, of good force; bowels opened; swelling on left side less; right eye is closed, but there is a decrease in swelling of right parotid; urine sp. gr. 1009, chlorides still very deficient, no albumen.

10*th*. Tongue soft and moist; swelling both of parotid and of neck very

much diminished; bowels costive; some appetite; on left side swelling has almost disappeared, on right side the gland is tumid; she allowed for the first time a poultice to remain through night; gland is painful to pressure, but less resistant; no eruption visible, but here and there a slight discolouration of the skin.

11*th*. Tongue soft and moist, with patches of white fur; pulse 95; urine sp. gr. 1017, chlorides increasing, no albumen, deposit of urates; but little appetite; bowels opened once by f℥ss ol. ricini; her expression is much better, and she is brighter and less peevish; there is no longer any swelling on left side, while on right it has much diminished anteriorly, so that she can open the right eye without difficulty; but just in front of ear and at angle of jaw there is still considerable swelling. On examining fauces, the right tonsil and wall of fauces project considerably into throat, forming a firm, elastic, non-painful tumour, which, however, does not interfere materially with deglutition. The solution of nitrate of silver was applied externally night and morning until last night; no application being made this morning; there is not the slightest salivation; urine sp. gr. 1017, neutral, or nearly so, no albumen, chlorides increasing, urates.

12*th*. Free discharge from right ear; integument is purplish and tense below and in front of mastoid process; passed a very restless night, crying with pain; pulse 85; skin cool; bowels regular; tongue clean and moist; urine sp. gr. 1017, marked increase of chlorides, no albumen.

13*th*. Left side presents no abnormal appearances, even small glands have gone back to natural size; discharge from right ear increased; swelling seems to point below ear, with distinct fluctuation; abscess opened freely by incision; urine sp. gr. 1017, slightly acid, abundant chlorides, no albumen, deposit of uric acid, granular matter.

14*th*. Abscess under right ear has discharged freely a thick pus; tongue soft and clean; pulse 90; appetite fair; she is very peevish and fretful, moaning constantly.

15*th*. Pulse 96; skin cool and soft; tongue clean and moist; abscess discharging freely; appetite fair.

16*th*. Abscess discharging freely and rapidly diminishing.

18*th*. Abscess discharging freely and a considerable amount of slough has become detached; child is much emaciated, and very nervous.

29*th*. A considerable portion of gland appears to have been discharged; suppuration ceased April 24th; since then the hole left by separation of slough has been filling up; child's strength and appearance very much improved; gums firm, and there has been no salivation; appetite excellent; runs about all day. In this case the nitrate of silver did not seem to have caused the least diminution or recession of the swelling—certainly not on the side almost wholly affected.

Here, too, the discharge came first from the ear, and the gland specially affected suppurated. This, in my experience, is the most desirable termination. Were it not that to go here more fully into detail would prolong this paper to limits ill-suited to the pages of a journal, many cases might be added, observed on other occasions, to show how little likely it is that absorption of the exudation will take place, and how apt parotid swellings are then to end in death. I do not refer so much to one-sided tumefaction, which always presents a far more favourable prognosis, but to those in which both glands are involved. When such cases terminate fatally the

parotid glands are found to be swollen and hard; on section a glairy fluid exudes from them, in which the microscope finds many granules, some granular nucleated cells, but very few pus-globules.

There is one more complication which I may notice, that in which *contraction and rigidity of the muscles* and very marked *cerebro-spinal symptoms* happen. I observed this in one striking instance. But let the case speak for itself.

CASE XII. *Typhus with rapidly occurring muscular rigidity and opisthotonos; death.*—Timothy S., a mulatto, age 22, who had been in the surgical wards of the hospital for upwards of a month, was transferred for chills and fever to the medical ward on Feb. 29, 1865. Notwithstanding that he took twelve grains of quinia daily, he had several successive chills recurring at about the same time of day, but otherwise there was nothing noticeable about his condition. He ate his food and appeared as well as usual.

On the 6th of March he complained of feeling sick at his stomach, for which he was allowed some lime-water with whiskey; and he was placed on milk and broth, and eggs as diet.

He continued feeling sick all day of the 7th; was listless, indisposed to talk, nor did his answers seem as rational as usual. Towards evening he became very restless, is stated to have spoken incoherently, and was constantly getting out of bed, running round the ward and disturbing the other patients; so restless in truth was he that at a very early hour on Friday morning he was fastened to the bed by the nurse.

When examined on the 8th, at the morning visit, he was found to be comatose, and his head drawn back. His eyelids were wide open and remained so; the pupils reacted sluggishly; the bladder was emptied by a catheter; the urine contained not a trace of albumen, but a large quantity of urates and phosphates; the pulse was feeble and very frequent. He remained much in this condition all day, seemingly hearing when spoken to, but taking no notice; with his eyes wide open, and a film from secretion covering them; the pulse did not change much, it was about 140; the first sound of the heart was almost extinct. But what was most striking was the position of his body. He lay with his head drawn very much backwards; his extremities rigid; the abdomen contracted; in fact there was complete opisthotonos, and the whole body could be raised by placing the hand at the back of the head and lifting it. He was stimulated as freely as possible, taking at one time six ounces of whiskey in the space of four hours; turpentine, ten drops every second hour, and carbonate of ammonia were also given; and as towards evening there seemed to be difficulty in swallowing he was nourished through a stomach tube.

On the 9th he was much in the same condition, occasionally he would mutter a few words and seemed brighter, but there was no real improvement in any of his symptoms; the pulse was very rapid; and his urine, owing to inability to void it, was repeatedly drawn off by the catheter. No paralysis of the limbs existed; and no eruption could be discerned on his dark skin. In the evening he died.

Autopsy sixteen hours after death.—Brain of firm consistence, and healthy appearance of brain structure; it was very slightly congested, as was judged by a fair number of red points being visible in the sections. The vessels of the membranes were moderately full of dark blood. But nowhere

was there the least sign of an opacity, or of exudation. Normal amount of fluid in ventricles.

Spinal cord was also of firm consistence and healthy appearance, and its membranes were only slightly, if at all injected.

Thoracic viscera: Lungs pale, anæmic looking; heart normal consistence, pale colour.

Abdominal viscera: Kidneys, spleen, and liver seemed healthy; bowels contracted, and some *post-mortem* intussusceptions; but mucous coat normal.

Blood dark looking, coagulated imperfectly.

In this extraordinary case, in which the *post-mortem* examination threw no light on the cause of the gravity of the symptoms, there were the most obvious cerebro-spinal phenomena; so obvious that the case will by many be looked upon as one of "spotted fever." But it happened in a man who had been for weeks in the hospital, and who was in a ward in which there had previously been several typhus fever patients, and where the nurse not long afterwards was seized with an attack of the fever, which proved also rapidly fatal. Yet, though I believe the disease to have been typhus fever to which either in consequence of the influence of the poisoned blood, or of the direct effect of the poison on the cerebro-spinal system, peculiar features were imparted, I have not included the case in the analysis of any of the symptoms made in this paper, so as not to vitiate the results arrived at by what might be regarded as a doubtful illustration of the malady.

Anatomical Lesions.—The lesions detected have been mentioned in connection with the fatal cases; but we may here briefly group them together. The most constant and significant change is the altered condition of the *blood.* It is much darker and more fluid than natural, and either perfectly diffluent or forms soft, black clots. It contains an increased number of white corpuscles, and the red are for the most part crenated and do not properly shape themselves into rolls. The white corpuscles inclose from one to four nuclei, which become readily apparent on the addition of acetic acid.

In no instance was any sign of inflammation of the *brain* discovered, or did the brain-substance itself look other than healthy. There was no effusion into the ventricles, nor was even congestion of the membranes a constant feature: in only a few instances were the veins on the surface filled with dark blood.

The *lungs* are commonly in a state of hypostatic congestion, yet crepitant. They are susceptible of inflation, though with more difficulty than in a healthy condition, and when inflated their dark colour disappears to a great degree. Portions of them may sink in water and be condensed by collapse, as in Case V., or consolidated by exudation, as in Case IX.

A markedly softened condition of the *heart* was only observed in one case, if we except Case IX., in which the morbid cardiac phenomena were very likely caused by disease prior to the fever.

Enlargement of the *spleen* is the rule, and the organ is usually darker and softer than in health. But there are no abnormal elements in its pulp.

The *kidneys* are generally congested; though a marked exception to this is reported in Case X. The tubular structure is clogged with epithelium, with tube-casts, and with granules, probably the urinary salts which collect on the tube-casts.

As much of the interest of the cases turned on the enteric symptoms, the *intestines* were in every fatal case very carefully inspected; and not in one was there the least appearance of a deposit in the solitary glands or in Peyer's patches, or of softening or ulceration of these structures; in other words, not a single case presented anything like the peculiar lesions of typhoid fever. Congestion of the lower portion of the small intestine, or of the colon, was the most common condition, and the solitary glands were more or less congested, and looked somewhat swollen and prominent; and when examined microscopically were found to be filled with blood. But we must recall the fact that severe diarrhœa was of usual occurrence in the fatal instances of the fever, and that the prominence of the glands was no more than is met with in many blood diseases, such as in smallpox and scarlatina. The same may be said of Peyer's patches, which were more distinctly marked than they normally are, and which in four out of the five cases presented little black dots interspersed in the patch and seemingly limited to, or at least more evident in, the small glands composing the agglomeration. This appearance, which has been likened to the shaven beard, was seen, when minutely investigated, to be dependent upon a reddish-brown pigment occurring in coarse granules of much lighter colour at the circumference than at the centre, or in aggregated masses of these. The pigment is uninfluenced by acetic acid. An enlargement of the mesenteric glands, though not a very great one, was noticed in two cases.

Duration and Mortality.—The duration of the complaint is, like that of any continued fever, difficult to determine, nor is perfect accuracy attainable. But fixing the commencement of the disease from the chill, or the coming on of headache, pain in the limbs, and heat of surface, and dating the convalescence from a brightening of the mind and countenance, a decided decrease in the pulse, a diminution in the temperature of the skin, a fading eruption, returning appetite, and increasing strength, the fever does not last three weeks. Only in very severe cases, or where complications have arisen, does it pass into the third week. This was the duration in 19 uncomplicated cases which terminated favourably:—

In 2 cases	12 days	In 2 cases	17 days
" 1 case	13 "	" 1 case	18 "
" 3 cases	14 "	" 1 "	19 "
" 3 "	15 "	" 1 "	20 "
" 4 "	16 "	" 1 "	21 "

Thus in about two-thirds recovery had fully set in before the seventeenth day of the disease, and only in one did it tarry until after the twenty-first.

Recovery was not indicated by a sudden and marked change in the symptoms; the fever reached a certain point and then declined, without, as a rule, anything that could fairly be called a decided crisis taking place. Yet it must be stated that in several instances it was distinctly noticed in those patients in whom the bowels had been regular or costive, that one or two large, even loose, passages happened at what proved to be the turning point of the illness; and the changes in the urine have already been alluded to. As a rule, convalescence was rapid, and not interfered with by any untoward events. The greatest inconvenience of which patients complained was pain in the calves of the legs, and particularly in the soles of the feet, constant, yet much worse at times than at others, attended with some soreness on motion and on pressure over the muscles, and seemingly a muscular hyperæsthesia.

The *mortality* of the cases that receive attention from an early period of the malady, is, considering its nature, not very great. Out of 39 patients under my charge in the Pennsylvania Hospital 5 died (not including Case XII.). The fatal cases have all been reported in full in this paper. It will be seen that excluding Case IX. from consideration, a man who would probably have succumbed to any acute affection, the deaths were in two instances due to complications rather than to the fever, and in two more strictly to the fever itself. In one of these (Case V.) death happened on the twelfth or thirteenth day of the disease. In the other (Case VII.) on the twelfth day.

But though the proportion of deaths does not appear to be so large as it generally is in typhus, the data here given are insufficient for calculating accurately its rate of mortality. The disorder shows all grades of the fever; and in accordance with the preponderance of one or the other, the death-rate will vary. I have seen, both in and out of the hospital, a number of very light and a number of very grave cases.

Treatment.—In discussing the treatment of the affection, I shall not attempt to apply the numerical method of analysis which has been chiefly followed in this inquiry. Whatever be its merits in regard to therapeutic knowledge, and I do not propose to discuss this vexed question here, it is very evident that to prevent fallacious inferences, especially where comparative methods of treatment are tested, the conclusions must be drawn from an extended series of cases, much more extended than that forming the basis of this paper. Nor will it be necessary to discuss in full the treatment pursued in all the complications which arose, for the cases reported will for the most part indicate what that was. I shall therefore mainly present an outline of the plan followed in the majority of the cases, and which seemed to me to be most advantageous, with the exception of mentioning some points which may not be readily apparent in the narratives here given, or which have not been touched upon.

And first, of the *hygienic* treatment. This was carried out by the most

careful attention to ventilation, to cleanliness, and to diet. The fever cases were, as far as was practicable, placed in a large room by themselves, and never more than four together, and the windows, even when the weather was cold, were kept open. The patients were sponged thoroughly morning and evening with vinegar and water, and not permitted to get out of bed. The diet consisted mainly of beaf-tea, broths, and milk. The morning and evening meals were composed of as much milk and arrowroot as was relished; at dinner a bowl of chicken soup was given; and in the intervals, strong beaf-tea, or milk, generally in the form of milk-punch, was administered every two hours. In some cases they were given one shortly after the other, in others alternately every hour, and in a few instances even oftener, according to the amount of prostration attending the case, and to the patient's digestive powers. But, as a rule, he was allowed to rest for two hours at a time, and strict directions were given not to awake him at night, unless the case were very urgent, when the time for his nourishment came, but to let him sleep, if possible, three or four hours, and then to give him more than the usual quantity of food and stimulus. The average amount of beaf-tea taken at a time, was two ounces, or about one pint and a half in twenty-four hours; though some took considerably more than this. Water was very commonly craved as a drink, and was never denied.

As regards the treatment by *medicinal* means, these were mainly stimulants, the mineral acids, particularly nitro-muriatic acid, turpentine, and, during convalescence, quinia, or the vegetable bitters. Stimulants were very generally administered; yet simply to sustain the vital powers, and though in some cases upwards of twenty-four and in others at least eighteen ounces of whiskey were given in the twenty-four hours, it was with no view of giving alcohol as food, nor of following out what is known as the stimulating plan of treating fevers, but simply because that quantity seemed necessary to check the tendency to death by exhaustion. Nor was delirium looked upon as a contra-indication to the administration of the stimulus; on the contrary, when associated with a very frequent pulse (as in M. D., Bed 34), a cessation of the cerebral symptoms, and a very decided fall in the pulse followed its free use. At times the condition of the patient was such that he had to be freely stimulated even from the onset; but this treatment was ordinarily avoided. Either no whiskey, or only a few ounces were given during the earlier days of the fever, and the quantity increased as the symptoms, such as more evident weakness, or trembling, or profuse discharges, or some depressing local complication, seemed to demand that increase, but not sooner. Six to eight ounces in milk-punch (one-third of whiskey and two-thirds of milk), and in divided doses by day and by night, was the average amount employed in the twenty-four hours; and its influence chiefly on the fulness and frequency of the pulse taken as the test whether to exceed this dose; so long as the pulse did not lose in volume

and rise, it was not increased. In one case, making an excellent and speedy recovery, and in which there was delirium with a rather full pulse, not a drop of alcohol was given until the patient was far advanced in convalescence. But the character of the typhus, which is clearly of the adynamic type, renders, for the most part, free stimulation a necessity.

Nitro-muriatic acid was more commonly employed than any other medicine. It was given in from 3 to 5 drop doses of the officinal acid, diluted in water. In not one instance did it appear to interfere with the milk diet of the patients, and seemed to be rather agreeable to them. It was sometimes given conjointly, or rather alternately, with turpentine, especially in cases presenting pulmonary complications; though the more common practice, when complications occurred, or distressing symptoms had to be relieved, was to stop the acid, and meet the indications. Most of the complications, the pneumonias and parotid swelling, were treated by turpentine and quinia. In the pulmonary affections, the turpentine was used both internally and externally. Quinia was not prescribed in simple cases of the fever, excepting in a few in which it was given in small doses combined with the acid. But, as already stated, during convalescence it was generally administered, and it was sometimes then combined with iron.

Purgatives were not employed, owing to the frequent existence of diarrhœa; yet, in cases in which constipation was present, laxatives were occasionally administered, or the bowels were kept open by enemata. Bearing in mind the fact that, just as the fever declines, free passages happen, it is a matter of advantage to act on the intestinal canal about that period. The treatment of the diarrhœa requires a good deal of care. If the patient had but two or three passages daily, and was not particularly prostrate, no attempt was made to check them. But when this became desirable, laudanum enemata, or acetate of lead by enema or by the mouth, either alone or joined to opiates, was found sufficient for the purpose, except in some cases in which the looseness of the bowels resisted opiates and astringents as stubbornly as it does at times in typhoid fever. In severe cases of diarrhœa the acid treatment was stopped; so was it often when vomiting took place, a symptom which was always found to yield to the admixture of lime-water with the milk.

In cases of much delirium, or prostration and trembling, chloric ether was several times given with apparent advantage, though these cases were for the most part met by an increase of alcoholic stimulants. Restlessness and insomnia were treated with small doses of morphia, and with camphor-water, or Hoffmann's anodyne. But in severe cases chloroform proved the most efficient remedy, either alone or given with camphor. This was strikingly shown in a lad 15 years of age (E. B.), who was utterly sleepless, very restless, and delirious. On the second evening of this state of things five drops of chloroform were given in a tablespoonful of camphor-water every second hour. After the fifth dose he grew calm, and slept quietly; his

delirium, too, was favourably influenced by the continuance of the medicine, and the pulse declined from 116 to 110. The next evening he took four doses of the preparation, and passed a quiet night; but subsequent to this the morbid phenomena returned, yet again yielded to the remedy.

For the relief of the headache, cold applications to the head and sinapisms to the nape were usually employed, and they seemed ordinarily to produce the desired effect.

In bringing this paper to a conclusion, a few words on the general nature of the fever, and on some points which, bearing on the question of its prevention, are even of larger meaning than a study of its symptoms and treatment. The disorder has occurred at all seasons of the year, and, though now waning, is still encountered. During the hot months of summer comparatively few cases happened. It is seen in children as well as in adults, and is not confined to any particular locality or class of persons; and though its greatest ravages take place in the southeastern part of the city, and in localities which, from their overcrowding and filth, would be apt to propagate the fever poison, cases are met with—it is true, not many—among those living in well-ventilated houses and in every comfort. The malady is, beyond all doubt, contagious. Several instances of those nursing the sick taking the fever, and even dying in consequence, have come under my notice; while in others slight fever, headache, and gastric derangement were observed, without the supervention of actual typhus, but clearly owing to the absorption of its poison. And when once in a house, more than one case is apt to follow. It was, indeed, not uncommon for whole households to apply in succession at the hospital; but, so far as could be investigated, in not a single instance was a case of typhoid and of typhus admitted from the same house. What its origin, whether imported from across the water and taking root in this soil, or generated here, is difficult to determine. Its occurrence at the time of a vast war, and typhus being the fever which is known to decimate armies, would naturally lead to the belief that it was brought from camps to cities; but typhus fever was scarcely one of the diseases of the American army, certainly not of any portion from which soldiers would have been apt to have been sent to this city. And its prevalence over so many parts of the world, in a more than usually aggravated form, lends colour to the belief that it has been brought here, or, at least, that our typhus constitutes part of that general typhus epidemic which is so wide-spread. That it presents characters of its own, should it really be found to be dissimilar to that prevailing in other countries, may be owing to local influences; for why can we not assume that diseases may be thus altered, and, if the expression be admissible, domesticated? Whether it is to become a permanent inhabitant, or pass away, time only can solve; but wherever it has shown itself—and I believe that it has been seen in many of our cities—the most stringent hygienic regulations ought to be enforced.

ART. II.—*On the Cause of Intermittent and Remittent Fevers, with Investigations which tend to prove that these Affections are caused by certain species of Palmellæ.* By J. H. SALISBURY, M. D., Professor of Physiology, Histology, and Pathology in Charity Hospital Medical College.

ALL views upon the origin of malarious diseases, up to the present, have been purely hypothetical. No one has attempted a detailed series of investigations connected with the expectoration and other excretions of the human system; the bodies suspended in the night air of malarious levels and inhaled, and the tracing of such abnormal bodies to their true source; and finally the developing of ague paroxysms with these bodies. With these few remarks, we will proceed to a brief description of our researches regarding the origin and cause of intermittent fever.

During a lengthy series of careful experiments, connected with camp diseases, and those affecting vegetation, as the "curl in peach leaves," and the "blight in apple, pear, and quince trees," &c., and in studying the causes and consequences of fermentation, gangrene, decay, and the changes going on in diseased tissues; I was led by some of the experiments connected with bodies suspended in the atmosphere, to inquire into the causes of fevers, and especially those of an intermittent type.

Intermittent fever began to show itself in the rich malarial districts of the Ohio and Mississippi valleys, in 1862, during the month of May. It did not, however, prevail to any great extent till the months of July and August. The weather had been unusually damp up to about the first of July. During the months of July, August, and September there was scarcely any rain. Springs and streams became very low, swamps and humid grounds became dry, vegetation almost entirely ceased to grow, and the country presented all the signs of a severe drought. Soon after the dry weather commenced, intermittent fever, in malarial districts, became quite general. The disease rapidly increased during the months of July and August, till it had invaded nearly every family on ague levels.

The observations were commenced by examining microscopically the expectoration of those labouring under intermittent fever, and who resided upon ague levels and were exposed during the evening, night, and morning to the cool, heavy, damp exhalations and vapours rising from stagnant pools, swamps, and humid low grounds; in short, those who were constantly immersed in a malarial atmosphere, and where every one was more or less affected with symptoms of miasmatic poisoning.

The first salivary secretions and mucous expectoration of the morning, were those used. In these secretions occurred a great variety of zoosporoid cells, animalcular bodies, diatoms, dismidiæ, algoid cells and filaments, and

fungoid spores. The only constant bodies, however, uniformly found in all cases, and usually in great abundance, were minute oblong cells, either single or aggregated, consisting of a distinct nucleus, surrounded by a smooth cell-wall, with a highly clear, apparently empty space between the outside cell-wall and nucleus. Their peculiar appearance satisfied me early in the examination that they were not fungoid, but cells of an algoid type, resembling strongly those of the palmellæ. This part of the inquiry was extended to a great number of individual cases, on the low malarial levels, and to persons residing on elevated lands near and far removed from malarial influence. Whenever the mucous secretions were examined, from persons residing above the summit plane of ague, these bodies were invariably absent. They were found only below the summit ague line; whereas, diatoms, dismidiæ, fungoid spores, and animalcular bodies, extended to some extent to all heights above the ague line; especially were they found in the vicinity of damp high grounds and streams.

After satisfying myself that these minute cells were the only forms found that could be relied upon as constantly present, on malarial levels and not present above them, my next step was, if possible, to trace their source and character.

In order to effect this, I commenced suspending rectangular plates of glass, sixteen by twenty-two inches, about one foot above the surface of stagnant pools and marshy grounds that were partially submerged. The plates were placed horizontal, each resting on four pegs, a single peg supporting each corner of a plate. The plates were placed in position at dusk, and secured in the morning before sunrise. Invariably the under surface of plates would be covered thickly with large drops of water. This condensed vapour was subjected to careful microscopic examination. Many of the cells were found that occurred in the expectoration; but none of those minute oblong cells, so uniformly present in the morning expectoration, were met with. On the upper surface of the plates, however, these bodies were found in considerable numbers. I repeated these experiments for many nights, varying widely the localities, with the same results.

In passing to the stagnant pools and swampy grounds southeast of the city of Lancaster, Ohio, to suspend the glass plates, I had to pass over a rich, peaty prairie bog, where the water had become mostly dried off, and the surface broken by the tread of cattle. I had noticed that in walking over this ground, a peculiar dry feverish sensation was always produced in the throat and fauces, often extending to the pulmonary mucous surfaces, and that my expectoration was, after returning, uniformly filled with the minute oblong cells above described. This drew my attention to the partially desiccated peaty prairie bog, where the surface had been recently broken by the tread of cattle. I discovered on the recently exposed earth, what appeared to be a whitish mould, or more closely the incrustation of some salt. I here suspended the plates of glass, and the following morn-

ing, much to my delight, found the inferior surface of the plates covered with the minute cells, which I was in pursuit of. I immediately returned to the bog and secured samples of fresh earth, which were covered with the incrustation, and some which were not, and also portions of the boggy turf. On placing a fragment of the incrustation under the microscope, it was at once discovered to be made up of aggregated masses of the minute cells so uniformly met with in the expectoration of those exposed to the influence of the heavy cool vapours of malarial levels. It was further seen that these cells were algoid, and emanated from plants of a palmelloid type, as we had previously suspected. That there were several species, and that in the larger ones, grew several species of mucidinous fungi.

The locality where these first results were obtained is situated on the southeast side of the city of Lancaster, between the canal and railroad, and just east of the depot and starch factory. Here stretches out to the southeast, along the canal, a low peaty, prairie bog, and in its vicinity the surrounding bottoms are low and humid. The portion of the town (3d ward) adjoining this bog, or all of it situated below a line about thirty-five to forty feet above the bog, has always been a fertile field for intermittents. Those living immediately on the edge of the bog are frequently subjects of ague, yearly, from May till November. August and September are usually the worst months.

To determine how high above the low grounds the bodies found on the under surface of the suspended glass plates were elevated, both at night and day, a small apparatus was used, which consisted of a glass screen standing perpendicular, and in front of it a large funnel, with the broad open end pointing from the screen, and the small end terminating within one-half inch of it. This was arranged on a pivot, and so constructed that the force of the currents of air kept the broad mouth of the funnel towards the wind. When an observation was to be made, the screen was covered with a concentrated solution of chloride of calcium, and the apparatus suspended at the desired height and left for one hour. The wind passing through the funnel, and falling upon the coating of calcium, deposits its small suspended particles upon the smeared screen. On examining under the microscope the liquid on the screen, after an hour's suspension, all the bodies floating in the atmosphere are found. By suspending this apparatus at different heights above the low ague levels, at all hours of the day and night, the following facts have been ascertained :—

1. That cryptogamic spores and other minute bodies are mainly elevated above the surface during the night. That they rise and are suspended in the cold, damp exhalations from the soil, after the sun has set, and that they fall again to the earth soon after the sun rises.

2. That in the latitude of Ohio, these bodies seldom rise above from thirty-five to sixty feet above the low levels. That in the northern and

central portions of the State, they rise from thirty-five to forty-five feet, while in the southern, from forty to sixty feet.

3. That at Nashville and Memphis, they rise from sixty to one hundred feet and more above the surface.

4. That above the summit plane of the cool night exhalations, these bodies do not rise, and intermittents do not extend.

5. That the day air of malarial districts is quite free from these palmelloid spores, and from causes that produce intermittents.

With the view of tracing more carefully the symptoms of the local fever, produced in the mouth, fauces, throat, and lungs, by inhaling the cells and sporoid bodies emanating from the vegetable organisms forming the incrustations on the drying, rich, freshly exposed soil of malarial grounds, I visited, Sept. 2d, 1862, the bog above referred to and spent some time in wandering over its surface, examining the incrustation, and in collecting samples for further microscopic study. In a very few minutes after my arrival on the bog, I began to feel a dry, feverish, constricted feeling in the mouth, fauces, and throat. This feeling increased till the fauces and throat became very unpleasantly parched and feverish. The opposite walls in swallowing adhered together, and the normal mucous secretions were quite entirely checked. There was a constant desire to swallow and hawk and spit, without being able to raise much, or to relieve in the least the dry, feverish, constricted sensation. This feeling soon extended to the bronchial and pulmonary surfaces, which became dry, feverish, and constricted, with a heavy congested sensation and dull pain. These peculiar symptoms lasted about two hours after leaving the bog before they entirely disappeared. The malarial matters inhaled appeared to be poisonous to the surfaces with which they came in contact; and there seemed to be an effort on the part of the exposed mucous surfaces to close up their absorbent and secretory organs, until this poisonous matter could be dislodged by the swallowing, and hawking, and spitting which they excited.

On the morning of the 3d of September I again visited the bog, to obtain more specimens for examination, and to study still further the symptoms produced by inhaling the malarious matters of ague bogs. I remained walking over the surface for about half an hour. The same train of symptoms manifested themselves that I experienced on the previous visit, being quite as severe and lasting quite as long.

On the evening of the third, just at dusk, I again visited the bog to suspend glass plates. I remained about fifteen minutes. I had scarcely left the ground when the dry, constricted, feverish feeling of fauces and throat commenced; and I experienced the same train of symptoms as on the previous occasion. Between this and the last of October I daily visited this and other similar bogs, always with the same result.

On Sept. 18th, Dr. Effinger, at my request, accompanied me over the bog, with the view of determining whether he would be affected with the

same train of symptoms as myself. In a very few minutes after our arrival the symptoms began in his case, as in my own, and he described them precisely as they have been already stated.

On Sept. 20th Dr. Boerstler walked over the bog with me and experienced the same symptoms. Dr. B. remarked that he had often experienced the same, or similar sensations before, without knowing the cause.

Numerous other persons, who visited with me ague grounds, were invariably affected with the same train of symptoms.

The only constant foreign bodies found in the expectoration of those affected with the above local symptoms produced by walking over ague grounds, and in the expectoration of those immersed in the night emanations of malarial levels, were the minute palmelloid cells previously described. The source of these cells was found to be the palmelloid plants growing in such profusion on the drying soil of ague lands during the prevalence of intermittents. It is hence inferred that the minute cell emanations from these low vegetable organisms are capable of exciting local fever in the mucous surfaces with which they come in immediate contact; and further, that there is strong presumptive evidence from what has been previously determined, that by repeated and continued exposure to them they may cause general fever of either an intermittent or remittent type. This will appear more conclusive after perusing carefully the observations and experiments which follow.

On the northwest side of Lancaster, in the vicinity of the old canal mill, is another district of considerable extent, where the people are universally subject to ague. With the view of exploring for the local cause, I visited the locality Sept. 12th. Immediately west of this infected district is a wide low rich prairie. A few rods south of the mill and also west of it, I found the ague palmellæ growing luxuriantly, covering the surface of the soil recently thrown up by moles and exposed freshly by the tread of cattle. In fact, over the entire prairie, wherever the soil had been recently exposed the plants were developing in profusion. While collecting samples for microscopic examination, I became affected with all the peculiar symptoms of local fever previously described.

On the north edge of Lancaster, immediately on the west and south sides of Mount Pleasant, is another locality where ague prevails in its worst form; often running into fever of a remitting and continued type. There is a low belt of ground running through this locality, along which are stagnant pools of water. Around these pools and in the rich humid broken soil of the vicinity, I found the ague palmellæ growing in profusion. While collecting specimens for examination, I experienced all the symptoms of local fever as previously mentioned.

On the Columbus road, about one mile northwest of Lancaster, on the farm adjoining on the north the old Tallmadge place, occurred suddenly, about the middle of September, a severe case of ague in a strong healthy

young man. This locality had been previously exempt from the disease. I visited the point with Dr. Effinger, who was attending this patient. About fifteen rods south of the house, we discovered a new ditch about ten rods long, running through a piece of low, black, humid ground. The freshly thrown out earth and the sides of the ditch were covered with ague palmellæ. While examining the soil along the ditch and collecting specimens for the microscope, the mouth, throat, and pulmonary surfaces became dry and congested as in previous instances.

This ditch was dug by the young man about two weeks previous to his attack.

On Sept. 21st, in company with Dr. Effinger, I visited Mr. C. and family who reside five miles northwest of Lancaster, in a locality previously exempt from ague. Mr. C. was attacked with a severe form of the tertian type of intermittent fever on Sept. 1st, and his wife on Sept. 3d. The paroxysms were arrested on the fourth day of the disease with quinia, by Dr. E., their attending physician. Relapse on the 15th; was arrested after the second paroxysm. Both Mr. C. and wife, on Sept. 21st, were much debilitated, pale and sallow. Mr. C.'s house stands upon the edge of a low terrace, elevated about 30 feet above the prairie bottom, which approaches within fifteen rods of it, on the south and southwest sides. About fifty poles southwest of the house, a small creek, running through the prairie bottoms, empties into the canal. This creek, during rains, washes in sediment and makes a troublesome bar across the canal. The *lessees* of the canal had purchased, a short time previous, of Mr. C. an acre of ground at the mouth of this creek for the purpose of excavating there a reservoir to receive the sediment of the creek. About the middle of August, the workmen began the excavation. The soil excavated was a rich, peaty loam, with some black and blue clay. Very soon after the excavating was commenced, the workmen began to be taken down with ague, and very soon nearly every man was labouring under the disease. On Sept. 1st Mr. C. was attacked; on the third Mrs. C. was taken down with the same type. On Sept. 21st Dr. Effinger and myself visited the excavation, and found the excavated soil covered with "ague plants," a quantity of which were collected for examination. While gathering them, both Dr. E. and myself were affected with the symptoms of local fever as previously described. Mr. C., who accompanied us to the excavation, became so much affected in the throat, fauces, and lungs, that he had to retire from the place. Mr. C. stated that he and his wife slept in a room in the southeast corner of the house, on the lower floor; while the children, seven in number, ranging in age from two to fourteen, slept on the second floor, immediately over theirs. He and his wife were attacked with ague on the first and third of September, while all his children were entirely exempt and perfectly well. He also stated that early every morning he noticed that the "fog" from the reservoir grounds extended to the house, and rose

about two-thirds the way up the first story, and entered freely his sleeping apartment through the open window, and had the same odour as the soil containing the ague plants, and produced the same febrile symptoms in the throat and fauces. He never had noticed this fog to rise as high as the second story window where his children slept. The foggy vapour dissipated soon after sunrise and before his children were up. He stated that he had lived there over forty years, and had never had the ague before. That all his neighbours around, on the same and lower levels, were now suffering from the disease. I mention this case particularly, as it is of peculiar interest, showing in a striking manner a quite fixed and marked line indicating the summit plane of invasion, above which the malarious causes do not extend.

In the eastern half of the city of Lancaster stands a hill, having an area of about one hundred acres. Upon its sides and summit the finest portion of the town is built. This hill rises to the height of about sixty feet above the adjacent low prairie bottoms, on its south and southeast sides. The heavy, cold, night vapours, emanating from these bogs, rise within fifteen feet of its summit. The upper surface of these vapours, in the morning before sunrise, is seen, from the surrounding hills, to be a broad, level plain, limited by its contact with the adjacent hills. The line described around this hill, by the upper surface of these vapours, is a horizontal one, and marks distinctly the ague line. All of those living on the hill above this line are exempt; all below are subject to the disease. The line is so well defined that, of people living on different floors of the same house, those on the upper floor are exempt, while those on the floor below are frequently all down with the disease. If any cases occur above the summit ague plane, they are found to be in such persons as frequent the lower levels during the evening or early morning.

During the summer of 1862, and especially during the months of August and September, intermittent fever prevailed to a remarkable extent in the town of Carroll, situated on the canal, between Lancaster and Columbus. The site of the town and much of the surrounding country is low, and many boggy places occur along the canal. During the months of August and September, the old and young of almost every family, including physicians, were down with ague. I visited this locality several times during these months, and found the ague palmellæ growing abundantly on the partially desiccated, boggy soil, along the canal, through the town and vicinity, and found the morning expectoration of all more or less filled with the minute cells of these plants.

Numerous other localities were visited where intermittent fever prevailed, and in every instance, without a solitary exception, the ague plants were found growing in the immediate vicinity of the disease, and in no instance were they found when the disease did not occur.

An interesting instance of the readiness with which the emanations from

these ague palmellæ produce the disease, presented itself, the last of September, one mile west of the city of Lancaster. At this point, a few poles south of the pike, and about fifty poles west of Judge Van Tromp's residence, is a small pond, that affords water to a small flouring mill. During the months of August and September, the water became low in this pond, and the ague palmellæ made their appearance in abundance on the drying, peaty mud, from which the water had retired. From the time these plants appeared, till the last of September, the wind was in the south. There being no buildings on the north side of the pond, there was no appearance of the disease. Near the last of the month the weather became cool, the wind changed and blew briskly from the north and northwest. About thirty poles a little southeast of the pond, twenty-five to thirty feet above it, on the hillside, a strong, healthy, labouring family resided, who had been, up to this time, entirely free from ague. The wind blew over the pond directly towards this house. About the fourth day, several members of the family were taken down with the disease. The wind now suddenly changed to the southeast, blowing across the pond, directly towards the tollgate, about forty poles distant, where a family resided in which were four small children. This family had been, up to this time, also exempt from the disease. The third or fourth day, two cases of intermittent fever occurred among the children, and soon after the father was attacked.

Here is an interesting instance of the transmission of the malarial influence by the winds. These families had lived for nearly two months in the vicinity of an abundant crop of ague palmellæ, without taking the disease. The pond being small, banks abrupt, and soil around dry, no fogs or night vapours, to any extent, emanated from the place to diffuse the poison. What malarial matters there were emanating from this point, were borne north by the prevailing wind. As soon, however, as the wind changed, and blew over the pond towards the neighbouring abodes, the disease, in a few days, appeared.

A very interesting instance of the sudden occurrence of intermittent fever, at a point where it was never known before, occurred at the residence of Hon. John T. Brasee, one and a half miles west of the city of Lancaster, upon an elevated ground, about one hundred feet above the ague levels, and far removed from them. The locality has always been, from the first settlement of the country (sixty-five years), exempt from intermittent fever. The farm is abundantly supplied with fine large springs of pure freestone water, cold and soft. Near Mr. B.'s residence, one of these springs occurs. It had formerly supplied a small fishpond, containing about ten square rods of surface. This pond, several years ago, had been drained, and the rich alluvial bed had become covered thickly with grass. About five square rods of it were spaded up, for the first time, in the month of July, 1863, for celery and vines. Ague palmellæ began to appear on the freshly-spaded soil about August 1st. A portion of these were white, like those usually

met with, while others were of a brick-red colour, giving to the surface the appearance of having been sprinkled over with a thin layer of brickdust. Aug. 8th, Mr. Brasee and wife, who slept on the lower floor, began to feel languid, with loss of appetite, and pains in limbs and back. 20th, Mr. B. had his first chill, which came on about 12 o'clock (noon). The paroxysm lasted about three hours, and was very severe. 22d, Mrs. B. had her first paroxysm, which continued for about three hours, and was also very severe. 23d, the farm-hand and his wife were attacked. Mr. B.'s residence stands about ten rods north of this patch of ague ground, and his tenant's house about fifteen rods south of it.

August 22d, I examined the patch minutely. It was perfectly covered with ague palmellæ. Those growing on the dry prominences of the soil were white; those on the retired, smooth, and more damp portions, were the colour of brickdust. The whole surface had the appearance of having been sprinkled over with brickdust and lime. No cases of ague occurred in that portion of the family who slept up in the second story, nor were there any premonitory symptoms of that disease.

August 24th, the small ague patch was covered, at my suggestion, with a layer of straw, to the depth of six inches. On suspending glass plates over this for several nights, I obtained no trace of the palmelloid spores or plants, while before the straw was spread over the plants, the glass plates were covered nightly with them.

The four cases of ague readily yielded to treatment, with no subsequent manifestations of the disease. The straw, in this instance, prevented the further development of the ague palmellæ, and prevented the spores of the already mature vegetation from rising in the damp night vapours.

Another interesting instance came under my observation in the city of Columbus, Ohio. On a visit to this place, during the last of September, 1863, I met Mr. Theodore Tallmadge, who stated to me that his children were all being attacked with ague. He stated that his family had been spending a few weeks at White Sulphur Springs, and that about two weeks before, they had all returned home hearty and well. In a few days after their return, one of his children was attacked with ague, and soon after, another. This surprised him, as ague had not previously been known to occur at his residence. Feeling satisfied that there must be some local cause, I, on the following morning, repaired to his house and examined his grounds. I immediately discovered a prolific crop of ague palmellæ directly in the rear of his kitchen, in some new, peaty soil he had drawn there, a few weeks previously, to level off the surface. I directed him to sprinkle the surface of the new soil thickly over with caustic lime, after which he had no more cases of the disease in his family.

On the rich limestone lands of the Maumee and Miami Bottoms, in Ohio, the black, alluvial lands of the Wabash and its tributaries in Illinois and Indiana, the fertile prairie lands of these States, and Missouri and Iowa,

and on the rich, low, limestone, and alluvial lands of Kentucky, Tennessee, and Mississippi, ague palmellæ develop in great profusion, especially during the months of July, August, and September. For the most part, wherever the soil is free from lime, and the water soft, the ague palmellæ developed are mostly white, or slightly tinged with yellow and green, and intermittents are comparatively free from congestive tendencies, and the types better marked, the eliminating organs much less liable to become badly deranged, and the paroxysms more readily yield to the tonic influence of quinia and iron, and the disease is quite promptly and easily controlled, unless the system be exposed to the continued and constant action of the cause of the affection. In limestone regions, however, where the water is hard and the soil highly calcareous, there is a remarkable tendency, during the months of July, August, and September, for the malarious portions of the soil to become covered with palmellæ, mostly of a different colour from those found on soil not calcareous. On calcareous soil the palmellæ are usually pink, brick-red, greenish, or yellowish. The brick-red and greenish plants are the most abundant. In such localities, intermittents are apt to assume a congestive type, the functions of the eliminating organs (epidermic and mucous surfaces, and portal and renal glands) become much deranged and partially suppressed, oxaluric, and often phosphoric states follow, and, in this condition of the system, quinia, iron, and arsenic, alone or combined, do but little good, and often in old and bad cases, tend to aggravate the disease. If, however, in these severe forms, the functions of the eliminating organs be restored to their normal or to increased activity, by the proper diuretics, diaphoretics, expectorants, and alteratives, the paroxysms readily yield to the tonic and anti-zymotic influence of quinia and iron.

College Hill, Nashville, Tennessee, rises from 75 to 100 feet above the level of the Cumberland, which flows around its northern and eastern base. Upon its summit is an area of from six to ten acres. Here stands the University of Tennessee, and the residences of several of the faculty. When the Federal forces drove the Confederates from Nashville all of the high points or eminences, in and around the city, were fortified, for the better defence of the place. This hill was strengthened by a ditch six feet wide and four feet deep, with the excavated earth thrown on the outside, and running around on the eastern and southern brows which face the adjacent country. Soon after the University buildings were appropriated for hospital purposes. This high point was supposed to be peculiarly healthy from its elevated airy position, overlooking most of the city and surrounding country. As soon, however, as the warm weather of May and June set in it was found that this high ground was quite malarious, giving rise to a peculiar type of congestive intermittent that was very severe, producing in some instances death. The attendants were more subject to the disease than the inmates of the wards. This, probably, arose from the

fact that the former often exposed themselves to the evening vapours and exhalations outside, while the latter were mostly confined to the wards.

This peculiar type of intermittent became much more severe during the months of July, August, and September. The surgeon in charge, Dr. Lynde, was under the impression that this malarial influence came from the low ground to the east of the hill which bordered on the river, and which was half a mile distant and 100 feet below. This, on careful inquiry, was found to be highly improbable, as the malarial influence was much less marked on this low ground than on College Hill. On carefully examining the soil on the perpendicular sides of the ditch, which was dug to strengthen the place, it was found covered completely with cryptogamic vegetation, forming, in places, a greenish, and in others a brick-red film on the surface. Samples of this soil were preserved in boxes for microscopic examination. On my arrival at Cincinnati, three days after, this vegetation was carefully examined under the microscope, and found to be composed of green confervoid filaments and palmellæ, having mostly a pale green and a brick-red colour. The vegetation was very prolific and abundant. The palmellæ were of different species from those met with on non-calcareous soils, and were similar to those in districts where intermittents are of a congestive type.

Occasionally the soil on the hill, where it had not been disturbed, was covered slightly with this same vegetation. This was noticed all through the city and surrounding country wherever there were any indications of a malarious tendency. It was not, however, noticed in any great abundance, except where the fresh soil had been thrown up to a depth below where it had been usually disturbed in cultivation.

The city of Nashville stands on a series of small conical limestone eminences, which rise from 50 to 100 feet above the river. The limestone comes to the surface, or nearly so. This is so much the case that the rock is perfectly bare, and denuded of soil, over at least one-fourth of the surface, while the balance has a covering ranging from two inches to four feet in thickness. Wherever a cellar is dug it is sunk into the solid rock. The same may be said of all sub-drains and sewers. The limestone is usually either porous, shaly, or massive, and is rich in fossil remains.

The soil on College Hill is rather deeper than on most of the surrounding eminences, and the summit has a larger and more level area. The digging of this defensive ditch changed the health of the locality, so that now, instead of being the healthiest locality in and around Nashville, it has become decidedly the most malarious and sickly.

On the limestone soil surrounding *Louisville, Ky.*, and in *Jeffersonville*, opposite, similar species of palmellæ are developed upon the soil to those found at Nashville. All the low limestone lands in this region appear to be more or less malarious. Those just above Jeffersonville, where is erected the U. S. G. Hospital, on the Chestnut Hill plan, are very malarious. This site is on a low terrace, about 70 rods back from the

river, and rising about 20 feet above the river bottom. Immediately upon the brow of this terrace is located the hospital. The grounds had several sink holes, filled with stagnant water, which now have been filled up. Around the base of the terrace, springs, for nearly a mile in length, make out, forming a boggy, swampy strip of ground, from 10 to 20 rods wide. The south wind blows over this directly up to the hospital. It is made up of a black sandy muck, underlaid with stiff clay. This soil produces, during the months of July, August, and September, abundant crops of ague palmellæ. On this account the hospital is unfortunately located.

The low grounds around *Cincinnati and Covington*, during the months of July, August, and September, produce the ague palmellæ to some extent, and are malarious. Intermittent fever, often severe, is here met with.

Camp Dennison.—At this point is located the *Dennison* U. S. G. Hospital. It is about 16 miles from Cincinnati, on the Little Miami Bottoms, and about 25 feet above the river bed. The soil is calcareous, being underlaid with limestone. The hospital inclosure contains 180 acres of bottom land. Through it passes a shallow ravine, a drainage line from the adjacent hills to the river. The northern fifth of the grounds, previous to draining them in the spring of 1863, with open ditches, was damp, the surface water standing till evaporated, the natural surface drainage being very poor. The wards standing on this soil were found to be unhealthy, the inmates being very subject to intermittent fever. Since it was drained the wards have been empty. The soil over this portion of the grounds, wherever it is exposed by eve drains, ditches, &c., becomes, during the months of July, August, September, and October, covered with a green, cryptogamic vegetation, which, in places, becomes of an ink-black colour. This vegetation is composed mostly of confervoid filaments, which are frequently terminated when mature by sporangia. These sporangia are noticed when the vegetation has assumed an ink-black colour, with a metallic lustre. Mixed with these filaments are numerous palmelloid plants of two species, one green and the other brick-red. When mature these plants, as they become dry, send off multitudes of minute spores, which are elevated in the night exhalations.

There is also met with on calcareous soils another species, of a metallic lead colour by reflected light. By transmitted light they have a dirty, brownish-green colour.[1]

[1] It may be here remarked that *Palmellæ* belong to the lowest known vegetable organisms. The several forms of this type which are constantly attendant on intermittent malarial disease have received the generic name *Gemiasma* (earth miasm).

Gemiasma (Salisbury). Plants having the appearance of cells, each consisting of a thin outside wall, inclosing an inside cell filled with minute spores, either single or aggregated, multiply by duplicative, segmentative within a parent mem-

So far as I have examined (and my observations have been widely extended), I never have found a case of ague, *in situ*, where I did not find

brane, and also developed from spores. Colours various, as red, green, yellow, white, plumbeous, &c.

There are several species which seem to act as malarial poisons. The brick-red, green, and plumbeous plants are principally found upon rich calcareous soils; while the greenish-yellow and white varieties are found mostly upon non-calcareous ground.

G. rubrum (Salisbury). Colour, brick-red. Gives the soil the appearance of having been sprinkled over with brickdust. Produces intermittents of a congestive type.

G. verdans (Salisbury). Colour, green.

G. paludis (Salisbury). Colour, greenish-yellow. Found mostly on non-calcareous soils.

G. plumbous (Salisbury). Colour, plumbous by reflected, and a dirty brownish-green by transmitted light.

G. alba (Salisbury). Colour, greenish or yellowish-white.

In all these species the mass of the visible dust, or incrustation upon the soil, is usually made up of incalculable multitudes of minute spores that have escaped from the plants beneath them. These most minute of all known organic cells are the organisms that are elevated in the night earth exhalations.

Another type consists of jelly-like protuberances, single or in groups, made up of a thin external membrane inclosing a highly transparent, gelatinous material filled with minute double walled spores. This type has received the generic name *Protuberans*.

Protuberans (Salisbury). (Ag. gave this name to a species.)

In these the double walled spores are developed in a highly transparent jelly-like frond, surrounded by a delicate membrane. These are various shades of green, yellow, brown, and, perhaps, other colours.

Another type of plants seem to multiply by the extending laterally of a thin lamina or gelatinous layer, which, like the protuberant variety, consists of an outside parent membrane, within which is a gelatinous matter, filled with a multitude of minute double walled spores, which escape in vast numbers as the lamina dries. This type has received the generic name *Lamella* (Salisbury).

All these genera have spores of a similar structure. The spores are mostly oval, or more or less oblong, and have double walls. The spores of the Protuberans are larger than those of the other genera, and the space between the nucleus and outside cell-wall is more marked.

In the Palmellæ there are two modes of propagation, one by division and the other by spores, and both of these are often common in the same species. These plants are very prolific, springing into existence in a few days in vast multitudes, during the hot summer months, on the drying beds of ponds, stagnant pools and ditches, on the broken soil of humid low grounds, and new prairie lands in malarious districts.

The species are many, all of which have heretofore been regarded as innocuous. There is strong evidence for believing, however, that the minute species that are developed in such abundance in the above-named localities, and the spores of which become elevated and suspended in such multitudes, in the heavy humid night exhalations of ague districts, are decidedly poisonous to the epithelial surfaces with which they come in contact, and are the true source of intermittent and remittent fevers.

these plants growing near; and *vice versa*, I never have found these plants growing in any locality but that (if such locality was inhabited) intermittent or remittent fever, or both, prevailed in proportion to their extent and profusion.

As early as the dry warm weather of spring and summer evaporates the surface water, and begins to dry off the recently exposed soil of rich humid low grounds and peaty bogs in certain localities; a peculiar white, green, or yellowish, or greenish-white, or brickdust powder, will be noticed making its appearance upon the surface. This is thicker in such places as have been recently broken, exposing fresh earth. It also varies considerably in appearance, according to age, rapidity of surface drying, and peculiarity of soil. It is not confined to desiccating peaty bogs and humid low grounds, but is common to the drying beds of streams, pools, ponds, and ditches, and also to calcareous soils, and even sandy plains in humid localities.

On the drying of the newly exposed soil of rich prairie lands and humid low grounds, this vegetation appears white and much thinner than on desiccating peaty bogs. This difference arises from the development on the latter of some larger species than grow upon the former, while the small species of the former are common to the latter. These plants occupy the projecting points and prominences of the soil, and resemble to the unaided eye, an incrustation of saline matter. During the drying of the soil, these plants develop rapidly, and as rapidly disintegrate and set at liberty their spores, which become elevated and suspended in the damp, heavy night exhalations. These exhalations, suspending their palmelloid cells and spores, rise, usually, so that their upper surface in the Northern and Western States, is marked by a plane varying from thirty-five to sixty feet above the surface of the ague grounds. The upper surface of these exhalations describes a horizontal plane, stretching away from the place of origin, in the direction traced by the wind. The spores and cells of these palmellæ are found diffused throughout these vapours, but do not extend above them. They occur, however, more abundantly at and near their upper surface, than lower down. This will explain the singular fact often noticed, that at a certain distance above the ague bottom, along the side hill, malarious diseases are frequently worse than on the bottoms themselves. The zone occupied by these exhalations has a temperature and hygrometric condition of its own; differing materially from the stratum of atmosphere resting immediately upon it, which is much warmer and dryer.

Plants in the Urine of Ague, which act as an Exciting Cause.—The urine of several hundred cases of intermittent and remittent fever has been subjected to careful microscopic examination, with the view of arriving at general results, as to the abnormal bodies present. The urine was in some cases voided before treatment had commenced; in others, after treatment had been continued for some days, without breaking the paroxysms; and

in others the paroxysms had been broken for the time with quinia, while the fever poison still remained in the system. The urine was voided, either in the algid, febrile, or sweating stage of the disease; between the paroxysms, or after the paroxysms had ceased for some days. The results of these examinations are highly interesting. They establish the fact that ague-plants, the same as grown upon the ague soil, are constantly developing in the system of the intermittent fever patient; and that the urinary organs constitute one important outlet for the elimination of this fever vegetation. That the urinary organs, with the perspiratory apparatus, are the important channels through which nature strives to rid the organism of the exciting cause, and through which the physician should operate by all the medicinal means at his disposal, to eradicate the disease. They explain to us the important reason, why it is that quinia breaks the continued recurrence of the paroxysms, while it does not eradicate the poison; and why diuretics and diaphoretics and expectorants are such all important aids in eliminating from the system the malarial cryptogams. While quinia braces up the system by its powerful tonic action upon the organizing processes of the epithelial tissue, and through this imparts such tonicity to the nervous system as to enable it to resist the paroxysms, it is well known not to exterminate the exciting cause; although it may control for a time their further development, in the same way that it checks the multiplication of yeast plants in fermentation.

This exciting cause must be carried out of the organism through those excretory channels which nature has provided for the elimination of effete and abnormal products. The principal of these are the perspiratory apparatus, the mucous surfaces and urinary organs. That the perspiratory apparatus performs in this disease an important office, in this eliminating process, we should long ago have understood, from the fact that through this excretory system nature so powerfully acts in her efforts to eliminate the abnormal and poisonous products of the disease. The sweating stage of the paroxysm of ague is essentially a curative one.

These examinations have also established the fact, that in intermittent fever conditions, torula cells are present, indicating the presence of glycogenic matter in the urine. Cholesterine is also uniformly present in this excretion in ague. Both glycogenic matter and cholesterine are found in the liver and spleen. The spleen is the great manufactory of cholesterine,[1] and at the same time organizes some glycogenic matter, as is evident from the development of torula cells in the spleen, when it is removed from the body and allowed to ferment.[2] The liver is the great apparatus for organizing glycogenic matter. The kidneys never normally organize or excrete these bodies. In intermittent fever, we see then, that the functions

[1] See my papers on the Minute Structure and Functions of the Liver and Spleen.
[2] Ibid.

of the liver and spleen, of secreting glycogenic matter and cholesterine, are in part taken on by the kidneys; indicating, perhaps, something like a metastasis of function; and pointing us to these organs for disturbances that are excited by the cryptogamic poison of ague.

There is also found quite uniformly in the urine the spores of a species of fungus—generally vegetating—belonging to the genus *Sphærotheca;* and which is uniformly found growing on and in the larger species of palmellæ, belonging to the genus *Protuberans*, and also in the apple, pear, and quince, producing decay in these fruits. I do not know that this plant produces any abnormal influence upon the system, as it is often met with in the urine of healthy persons.

The ague plants occur in the urine in the form of little cottony flocks, so small that they are scarcely noticeable by the unaided eye, and too few in number to communicate turbidity to the excretion. They vary greatly in amount present in different cases. They are uniformly more abundant when the disease is severe and has continued for some time. They are very light in colour, highly transparent, and appear to be developed in the bladder, pelves of kidneys and ureters, often in considerable numbers. In some cases of ague of long standing, yeast plants, species of *Pennicillium* and *Aspergillus* are also found, developing in large numbers, the mycelia often rising to the surface, a short time after the urine is voided, producing fertile threads and fruit. These plants were found largely developing in the urine of several patients, in the month of September, who had been labouring under the disease most of the summer. In several instances of this kind, I have known the intermittent to merge, after some weeks, into continued fever of a typhoid type. In all cases of this kind, the patients had been receiving constant accessions to the disease, by being exposed daily to the exciting cause.

Plants in the Urine of Intermittent Fever, Consequent on Peculiar Pathological States.—In the urine of all cases of intermittent fever, the spores of Pennicillia are present, indicating the presence of glycogenic matter undergoing fermentative changes. These cells are generally more abundant in obstinate types, and in cases of long standing, than in the milder forms and recent cases.

In several instances, in observations, where the patients had been labouring under severe and obstinate forms of the disease (such as were exposed to constant accessions) for many weeks, tending to typhoid states of the system, the urine was found containing numerous vegetating fungoid filaments, which were the developing Mycelia of Pennicillia, Aspergilli, or Sphærotheci. In these obstinate cases of the disease, the urine passes rapidly to the acetous fermentation even before it is voided, ushering in filamentous development in the cryptogams present. This fermentation progresses so rapidly, that in a few hours after the urine is voided, putrefactive fermentation begins, and small white cottony flocks or tufts of fertile

threads appear above the surface. These soon bear spores, when the plants are discovered to belong either to the genus Pennicillium, Aspergillus, or Sphærotheca.

There is a beautiful species of Pennicillium often present, having symmetrical heads, the stem dividing first into four equal pedicels, which ascend close to each other, and soon subdivide each into four pedicelets, each one of which bears a long moniliform line of spherical spores. I do not know that these cryptogams are at all injurious of themselves in the urine; but they indicate the presence of glycogenic matter and rapid fermentative changes, which are abnormal. They are probably merely the consequences and not the cause of the existing pathological states.

Experiments Relative to the Production of Intermittent Fever.—With the view of obtaining still more positive evidence of the intimate relation between the cause of intermittent fever and the cryptogam developing upon drying humid soils, &c., I filled six tin boxes with the surface earth from a decidedly malarious drying prairie bog, which was covered completely with the palmellæ previously described. Cakes of the surface soil were cut out, the size and depth of the boxes, and fitted carefully in, without disturbing more than possible the surface vegetation. The covers were then placed on, and the boxes transported to a high, hilly district, some five miles distant from any malarious locality, and where a case of ague had never been known to occur. The locality was over three hundred feet above the stream levels, was dry, sandy, and rocky. I here placed the boxes of cryptogams on the sill of an open second-story window, opening into the sleeping apartment of two young men; removed the covers and gave particular directions that the boxes should not be disturbed, and the window left open. On suspending a plate of glass over the boxes on the fourth day, during the night, the under surface of the plate, the following morning, was found covered with palmelloid spores, and numerous cells of the same kind adhered to a suspended plate in the room, which was moistened with a concentrated solution of chloride of calcium.

On the twelfth day one of the young men had a well-marked paroxysm of ague, and on the fourteenth the other was taken down with the disease. They both began to feel unnatural and dull about the sixth day. All three stages of the paroxysms were well marked. The type in both cases was tertian, and was readily controlled by the appropriate remedies.

Four members of the family slept on the lower floor of the house, but none of them were affected.

The experiment was repeated at another point, in the same neighbourhood, where one young man and two boys were exposed in the same way as described in the previous case. In this instance, the two boys were taken down with the disease; one on the tenth and the other on the thirteenth day of the exposure; while the young man escaped.

On account of other duties, and the difficulty of obtaining the consent of parties for experiments, I have been unable to conduct this part of the examination further. The experiments thus far, however, are most highly interesting and confirmatory of the previous observations and results of this extended inquiry, on which nearly three years of almost constant labour have been bestowed.[1]

Pathology of Intermittent Fever.—The lesions in intermittent fever are confined mostly to epithelial structures, showing quite conclusively that the exciting cause acts primarily upon the parent epithelial cells; or, those cells that either organize the products that nourish the several tissues, or disorganize those of interstitial decay, so as to prepare them for ready elimination.

These derangements consist in the altering and enlarging of glandular structures, and in inflammations and alterations in structure and function of the mucous, epidermic, and serous surfaces. All other abnormal manifestations are either symptomatic of these, or are the result of previous disease in the organism.

All the glands in the body belong, strictly, to epithelial tissue, and are made up mostly of parent epithelial cells. These structures are affected in time and extent apparently in proportion to their importance in either organizing and assimilating products for nutrition, or disorganizing those for elimination.

Of all the lesions met with in fatal cases, those of the spleen and liver —most important organs of the body—are the most frequent. The spleen increases in bulk and consistence; its structure is easily torn; its interior often being found to be broken down, and composed of a blackish-red pulpy mass, with which are mingled fibrinous portions of a lighter colour.

Morgagni gives one case where the spleen weighed eight pounds; and another is mentioned by Bailly that weighed nearly ten pounds, the structure being entirely converted into a pulp. The spleen has been occasionally ruptured, and the broken-down and altered tissue emptied into the abdominal cavity. This indicates an altered condition in the organizing processes of the parent epithelial cells of the organism, by which the fibrinous matters and other products of the blood formed, become deposited in the splenic tissue, thus producing enlargement (so-called ague cake) which often, if the patient is not removed from constant accessions to the disease,

[1] Another interesting instance of the production of ague paroxysms by this vegetation, occurred since this paper was partially in type. After exhibiting, about the first of November, a large pan of soil, covered with this vegetation, to the class in one of my lectures, I placed it under the working-table in Dr. House's office. It was loosely covered with a newspaper, and forgotten. In a few days the doctor began to have pains in the back and limbs. These symptoms were soon followed by a well-marked paroxysm of ague. As soon as this occurred the pan of plants came to mind and was removed.

and the exciting cause not eliminated from the organism, results sooner or later in disorganization, and frequently in disintegration of the gland. The liver is also in some cases found greatly enlarged, but altered but little in structure. In others it is softened or filled with black blood, or tuberculated, or containing purulent deposits.

The pancreas is also frequently hardened, so as almost to resemble scirrhus. The mucous membrane of the stomach, duodenum, and small intestines are likewise sometimes involved.

The mesenteric glands are frequently enlarged, and are subject to very nearly the same derangements in function and structure as the spleen.

The exciting cause, inhaled, taken into the system in food and drinks, and absorbed by the skin and mucous surfaces, comes in direct contact with the epithelial cells, spread over and covering the entire body, both internally and externally, wherever there are any ways by which external bodies may enter the organism. The epithelial cells, hence, make up the first tissue of the system with which these poisonous bodies come in contact. These cells they have to pass through before they can enter the systematic circulation and reach the vascular tissues. In passing through these cells, they derange them so as to poison the products they organize. In this way the other tissues, including the ganglionic and cerebro-spinal systems, become involved. As the epithelial cells of the glands, especially those of the spleen, mesentery, and liver, are the most largely engaged of any in organizing nutrient products for the other tissues, these glands are the most severely taxed, and are the first to suffer extensively from the poisonous palmellæ, and hence it is that in these we find so frequently grave lesions.

When the tissues have become poisoned to a certain extent, there is a reaction on the part of the system, an effort of nature to eliminate the poisonous products already in the body. This effort is the paroxysm, which constitutes what we call the disease.

We can readily see how it is that the blood of the body should become thin (deficient in fibrin) as soon as the functions of the spleen are partially or wholly suspended. This being the gland which organizes fibrin more largely than any other, if its function in this respect be suspended by the blocking up of the *oval splenic bodies* with partially organized fibrin, one great source of this product would be cut off from the blood. The fibrin already in the blood becomes deposited in the tissues, and one important source being cut off, the blood becomes thin and deficient in this body. This thin blood fills up all portions of the organ not occupied by masses of fibrin, and hence the ease with which the blood contents of the spleen may be washed out. Whenever the whole mass of the blood of the body becomes very abnormally thin, we may look to the spleen for the primary lesion.

Some of the interesting symptoms of intermittent fever, where the spleen

is involved, Dr. Tweedie says, are "depression of spirits, torpor of mind, inactivity of body, with much muscular debility, deadly paleness, or a yellowish hue tending more to black or green than in ordinary hepatic disease. There is great liability to hemorrhage from various regions of the body, to dropsy, to dysentery, and to ulcers of the legs. The spleen is liable to take on a morbid condition in continued fevers, as well as in intermittents. Diseases of the heart, stomach, and liver, are liable to be accompanied by diseases of the spleen. The spleen is more liable to be affected with disease in damp, marshy localities than in other situations. In intermittent fevers there is a diminution of red globules and fibrin. Softening and the breaking down of the spleen are common in intermittent and continued fevers, in scurvy, and in some varieties of malignant dysentery."

By understanding the true functions of the spleen, these symptoms and lesions are all traceable to their true cause.

Depression of spirits and torpor of mind may arise from either oxaluric or phosphatic states, or from a defective or suppressed organization of some of the nutrient products of nerve tissue; inactivity of body and muscular debility, from a deficient supply of fibrin to muscular tissue; the yellowish hue, to a defective supply of red globules; the great liability to hemorrhage in different parts of the body, dropsy, and dysentery, to thinness of the blood, and the defective supply to it of its normal products.

The probable reason why the spleen is so liable to take on a morbid condition in continued fevers as well as in intermittents, is that the exciting causes of both affect primarily the epithelial tissue, and have a tendency to derange those portions most which are the most actively engaged in organizing nutrient products, the reason of which appears to be that the exciting causes exist alike in the materials we eat, drink, inhale, and absorb through the skin.

The reason why the spleen is more liable to be affected in damp, marshy localities than in other situations, is, that in the former districts, miasmatic poisons impregnate more or less the air, the water, and the food.

The reason of the diminution of fibrin and red globules in the blood in intermittent fever is the greater or less suppression of the normal functions of the spleen and mesenteric glands.

Treatment.—Since nature in the last stage of the paroxysm excites all the excretory organs of the body, and especially the perspiratory, urinary, and mucous surfaces generally; and as these excretions contain spores and plants of the ague palmellæ, it is evident that the sweating stage is a curative process. If so, it points us to important medicinal means as aids in eradicating the poison. These are diuretics, diaphoretics, expectorants, and alteratives. While we should keep quinia constantly in the front rank to impart tonicity to the ganglionic and cerebro-spinal systems and to the epithelial tissue and to control in the body cryptogamic development, we should use diaphoretics, diuretics, and expectorants freely as eliminators.

The nightly sweating of a patient labouring under this disease, might be supposed to result in enervating the system. The reverse, however, is the case. Under active nightly diuresis and diaphoresis, in ague, the sallow countenance rapidly clears up; the dull eye becomes bright; the depression of spirits and torpor of mind and body disappear, and give place to the elastic step and tonicity of muscle. The result is, that, even when the system is exposed to constant accessions, the paroxysms are not only avoided, but organic lesions, and the long train of unpleasant symptoms are not allowed to get their hold upon the system, the ague poison being eliminated as fast as taken into the organism.

In cases where the patient is removed from the exciting cause, the system is soon thoroughly cleansed, and no ague returns the following spring unless there are new exposures.

The power of the system to resist the paroxysms of ague varies greatly in different individuals, and even in the same individual at different periods. This power of resistance is directly proportioned to the tonicity of the system. Habits of bracing, active exercise, such as horseback riding, will often protect the system against attacks. This is noticed in a marked degree in the cavalry and infantry service of the army. In malarious localities, the former are seldom attacked, if on active duty, with intermittent fever; while the latter are extremely liable to suffer. This is the case when both branches of the service are occupying the same malarious district, and are equally exposed.

Quinia, as a prophylactic, enables the system to resist the paroxysms. It braces up the system, and controls cryptogamic growth till nature can effect a cure by eliminating the malarious cause through the skin, mucous surfaces, and kidneys. Quinia, then, is not, strictly speaking, a curative or specific agent, but simply acts beneficially by controlling cryptogamic development, and imparting such tonicity to the organism as enables it to resist the paroxysms, till aided nature can cure the disease by eliminating the cause. Any cause that enervates the system in malarious regions, tends to bring on the paroxysms earlier than they otherwise would appear. Very frequently it is noticed, especially when the system has been under the influence of the disease for some time, and most especially if the disease is contracted in a region where there is a tendency to congestive paroxysms (limestone regions especially) as in the southern part of Tennessee, in Mississippi, and Louisiana, quinia appears at first to have some influence in enabling the system to resist the paroxysms, but soon loses almost entirely its power. In fact, in many instances, it really aggravates the paroxysms, as is evidenced by stopping the quinia entirely. In such cases the skin will be found dry, the mucous surfaces less active than normal, and covered with a scant, clammy mucous secretion, and the renal excretion small; in fact, all the eliminating organs have their functions deranged and their normal action partially suppressed. As long as these are in this condition, the

malarious poison is hemmed up in the organism, so much poisoning the tissues, that the tonic influence of the quinia rather tends to aid, frequently, the abnormal actions than to restore the normal tone. If, however, the normal functions of the kidneys, skin, and mucous surfaces are restored, with diuretics, diaphoretics, and expectorants, and the spleen and liver properly attended to, quinia again will act beneficially and impart its usual tonic effects and the disease will soon be eradicated, especially if the patient be removed from constant accessions.

It is highly important to constantly endeavour to keep the eliminating organs in a healthy and rather increased state of action, when the system is under the influence of any malarious poison, as it is through these channels that the causes are eliminated. We have, then, in this disease, no such thing as a specific in *quinia*. It simply imparts tonicity to the system, and controls cryptogamic development, till Nature, aided by remedial means for exciting the excretions, is able to eliminate the poison.

These principles should be strongly impressed upon the mind of the physician who has charge of malarious diseases. Many old and obstinate cases of ague, with the system filled with the malarious poison, and all the channels of egress closed, are being daily dosed largely with quinia, arsenic, and iron, with little or no effect, with the view of curing the disease in some empirical and mysterious way by these so-called *specifics*. The very name *specific* should be blotted from medical science, and left entirely to the *quack*, who knows nothing else. There is really no such thing in medicine. All we can do in any disease is to aid Nature, and to follow her as closely as possible in her curative processes, and this we can only do wisely and well, by understanding fully the true cause and pathology of every disease we treat.

In treating intermittent fever, it is of the first importance to correct any abnormal condition of the portal system, and to accompany this by diuretic, diaphoretic, and expectorant remedies, to excite into activity all the eliminating organs of the body. It is impossible to mark out a fixed course for all cases. The following prescriptions will, however, illustrate the general plan of treatment:—

℞.—Potass. acetat. ℥ij; spts. nitr. dulcis ℥j; syr. scill. comp. ℥ss; aquæ menth. pip. ℥viij.—M. S. Take from one to two tablespoonfuls, in a glass of water, morning, noon, and night. Every evening, on retiring, take a warm diaphoretic draught.

Also, ℞.—Quiniæ sulph. gr. xxxij; strychniæ sulph. gr. ¼; mass hydr. gr. vj; pulvis capsici gr. xx; ferri lactat. gr. xx; ext. gentian. syrup. āā q. s.—Make pills xxxii. S. Take two pills every two hours till sixteen are taken. Every day or every other day after, according to the type of the disease, take four pills two hours before the time for the paroxysm. At the end of ten days, take two pills every two hours till sixteen pills are taken, and continue as before for ten days more, then take

sixteen more pills. By this time, if the eliminating remedies are kept faithfully up, the patient will be thoroughly cured, if he is not exposed to constant accessions. If he is, the eliminating organs must be constantly kept excited, that the cause may be removed as fast as it enters.

Under this treatment a paroxysm need never occur after the commencement of the remedies.

The means are within our reach for *removing the prolific cause* of intermittents. Rich, humid, low grounds, which produce ague plants abundantly when they are new, undergo some change by culture and drainage, that unfit them for the growth of the palmellæ. As the malarious portions of the country become older, and the low, humid, rich grounds become drained and cultivated, ague districts will become more and more circumscribed, and intermittents proportionally decrease. As long, however, as there remain in such localities, pools, ponds, ditches, and streams, the beds of which are liable to become more or less dry during the warm summer months, intermittents may be expected, to a certain extent, to prevail. These sources of the disease, however, may be much lessened by turning the open ditches into blind ones, draining pools, swamps, and ponds, and subjecting the soil of their beds to repeated cultivation. By this process, intermittents, which now extensively prevail over a large portion of our richest districts, may be so circumscribed in their limits as to be no longer a dreaded accompaniment to the most fertile agricultural sections of our country.

Where it is necessary to make excavations, during the warm, dry months, in new, rich, humid soil, the bottoms and sides of these excavations, with the earth removed, should, at the close of each day's work, be plentifully sprinkled over with caustic lime. If this precaution be well attended to, the ague plants will not develop. It is also highly desirable, in making ditches through malarious soil, to keep the bottom, sides, and thrown-out earth well sprinkled with lime.

As fast as the beds of streams, ditches, pools, and ponds, in ague districts, become dry, they should also be well strewn with caustic lime. This is especially desirable, in this climate, during the months of July, August, and September.

When new prairie land, or new, humid, low ground, is being turned up for the first time, and lime can be readily obtained, it will save much sickness by sowing it over with a good top dressing of caustic lime. If one application is not sufficient to check the growth of ague plants entirely, a second should be made. This application will by no means be lost on the soil, as it serves to neutralize acidity, convert resinous matters into soluble soaps; and the soil is thereby rendered more fertile, and that its increased and better crops will more than pay for the lime application. If lime cannot be obtained, wood-ashes may be used, though their effect will not be as marked or enduring. In selecting camping-grounds for armies, or locations for

hospitals, new soil and low prairie, or other humid grounds, should be avoided as much as possible. Wherever open ditches are made, streets excavated, wells and cellars dug, or new earth thrown up or exposed in any way to the drying influence of the sun and atmosphere of May, June, July, August, and September, and especially during the two latter months, if the region is at all malarious, caustic lime should be freely strewn over all such excavations, and over the heaps of soil removed.

Influence upon the System of the Pollen and Volatile Principles of Phænogams when inhaled.—The spores and exhalations of cryptogams are not the only bodies in the atmosphere that excite, when inhaled, abnormal and diseased conditions. During the active flowering of phænogams, the air becomes loaded in their vicinity with the pollen of the flowers, and volatile principles of the plants. These matters are inhaled in large quantity by those breathing the atmosphere containing them. If the plants produce no innocuous or active medicinal principle, the pollen and exhalations, except in particular instances hereafter referred to, have no abnormal influence upon the organism. But if they produce poisonous products, or active medicinal agents, the influence of the pollen and volatile principles inhaled is readily felt.

In passing through or past a field of hops, lettuce, or poppies, in flower, a sensation of drowsiness is soon felt, accompanied often by lassitude and indisposition, either to mental or physical action. In passing through a field of stramonium in bloom, or tobacco, similar sensations follow, with nausea, weakness, a tired sensation about the eyes, followed by pains in the head, &c. In passing among the plants of conium maculatum in flower, drowsiness, with a stiffness of the eyes, followed by swelling of the orbital tissues, and a dull pain in the eyeballs and forehead are the result. These symptoms vary much in severity and duration, according to the time the system is under the influence of the deleterious agents, and the quantity inhaled and absorbed by the surface.

In passing among poison ivy (*Rhus vernix*) when it is in flower, the effects are often so powerful, especially when the air is damp, and during the night, as to produce extensive œdematous swelling and inflammation resembling erysipelas. The pollen of several species of lobelia excite nausea and giddiness. There are many other plants that possess powerful medicinal and poisonous agents, growing in our forests and upon our prairies, the pollen and volatile principles of which, when inhaled, produce marked derangements.

Many exotics of the greenhouse come also under this head. The flowers of all such plants should be avoided as much as possible. Many of those unpleasant sensations experienced by travellers and explorers in a new country, while passing among luxuriant plants and beautiful flowers, arise from the inhalation of the pollen and volatile principles of this vegetation.

No doubt many diseased conditions may have their origin in such exposures.

Dr. Isaac Hays, editor of the *American Journal of the Medical Sciences*, detailed to me, a short time since, some most interesting instances, that had fallen under his observation, of the influence of the pollen of the rose, and also several cases of the influence of the pollen of, and exhalations from, the cereals and other phænogams upon particular persons.

The exhalations from certain plants, when not in flower, produce, on some persons, marked effects. As an instance of this, the poison ivy (*Rhus vernix*) may be mentioned as producing violent symptoms of poisoning, in certain cases, without ever coming in contact with the plant. Such susceptible persons are able to distinguish its presence before they are able to see the plant, by the effect of the air upon them.

Some are highly susceptible to ipecac, it producing peculiar symptoms upon them by simply being in the room with it. Calomel will also frequently excite temporary salivation and nausea in some by simply handling it.

Numerous other instances might be added to those already briefly referred to, to show the effects, upon either some or all systems, of extremely minute portions of certain bodies when inhaled. It indicates to us the probability that the atmosphere may contain many of those subtle causes of disease, which have thus far eluded the search of so many long and patient inquirers.

In conclusion, I may state that this paper presents merely a brief of the investigations in this direction. All the microscopic descriptions, with six plates of illustrations, and many detailed observations and experiments, are omitted, on account of the whole being too long for an article in a medical journal.

ART. III.—*An Inquiry into the Causes of Certain Diseases on Ships of War.* By EDGAR HOLDEN, M. D., late Assistant Surgeon U. S. Navy. Read before the Essex Medical Union, of Newark, N. J., and published by request of the Society.

IT is not designed in this article even to touch upon the interminable discussions regarding the construction, regulation, and climatic liabilities which may, upon ships in general, act as causes of disease, or to discuss, so far as it is possible to avoid it, those common well-known diseases peculiar to men congregated in restricted quarters, but to review briefly and present as concisely as possible, *three* maladies most prominent upon our national vessels and on our own coast during the past four years. Even

the scorbutic element must be excluded from the list. Once the scourge of the navy, this latter disease has become less the enemy of the sailor than the soldier, and the unlimited supply of vegetables in a canned, or desiccated state, and prophylactics, of medicinal renown, in various forms have rendered the disease comparatively infrequent.

Indeed, it is a fact worthy of remark, and one reflecting credit upon the profession, that the list of diseases peculiar to shipboard has become exceedingly small, and to-day there is, perhaps, no place where men are associated together where more scrupulous regard is paid to cleanliness and comfort, or better general health prevails than on the vessels of war of the American Navy.

The first and somewhat prominent point to which I would at present allude is the influence of hydro-sulphuric acid.

For a long time this intensely fetid gas, generated in the bilges of ships, was regarded as the chief agent in the production of disease, yet its precise origin and the particular nature of its influence were not generally understood. It was well known that decomposition of vegetable matter together with a moist and long confined atmosphere, were concerned in its generation, but its effects when medicinally administered, *i. e.*, inhaled, or taken in saturated watery solution, were insufficient to explain the phenomena so generally ascribed to it. That we may ascertain its precise influence, and whether, indeed, it is at all instrumental in the production of ship diseases, it may not be out of place to inquire into its general and toxical properties.

The bilge of a ship being the lowest part of the hull, there is always a gradual accumulation of water from the frequent washings of the lower decks and the slight leaks in various parts of the frame. With this water goes down, of course, more or less vegetable and animal matter readily decomposable in the closely confined air. After the ship has lain long at anchor in smooth water or in port, and becomes subject to the motion of the waves, the gas in question is forced up through every crevice, and might now be supposed to produce, if at all, its deleterious effects. On the contrary, however, it meets at its very exit an enemy more subtle than itself in the peroxide of hydrogen, which, under the name of ozone, is supposed to give so bracing a character to the sea-air; and also in the free chlorine, which to a slight extent exists, and which most rapidly decomposes it. However concentrated the acid may have become, and even when the air seems completely saturated, as it does when the pumps are called in play and the filthy blackened water is allowed to run over the deck to the scuppers, its effect is hardly perceptible.

Occasionally, after the bilge has been long neglected, a prevalence of headache and transient lassitude may be noticed, but seldom to such extent as to require treatment or suggest a single fear of actual disease. Even in the case of sailing ships, where it becomes necessary to use drinking water

impregnated with the acid, the effects seem not to be those that we well know are peculiar to the ordinary exhibition of it in solution, as lassitude, nausea, and, in extreme cases, convulsions and loss of sensibilities, but rather those arising from the actual bodily presence of decomposing organized matter, belonging to the stagnant water itself, such as eruptions, diarrhœa, etc.

The gas, as usually encountered on shipboard, is not then responsible in itself for the diseases ascribed to it. Yet I am convinced that there is a way in which it is responsible for certain diseases, and for this reason the subject is introduced into the present article. I refer to its agency in connection with various species of cryptogamæ in production of miasma.

It is with considerable diffidence that I endeavour to present the result of my observations on a subject so hackneyed, so familiar, yet so little understood.

It would be as uninteresting as useless to enter upon the various theories that have, from time to time, been advanced regarding the atmospheric condition or peculiar poison upon which malaria depends, nor is it at all necessary to the present purpose.

That it is essentially organic, and that heat, moisture, and attendant decomposition are instrumental in loading the air with the deleterious particles has become too universally the opinion to require more than passing allusion. Observation of the following accidental phenomena has led me to the belief that in many or most instances on shipboard the poisonous substance in question depends not only on the floating spores of a species of cryptogamia, as is usually believed, but that the particular species is the division known as Thallophyte, that they are inert to a great degree, perhaps entirely of themselves, but that in the presence of sulphuretted hydrogen they will generate miasm and produce disease.

I dare not presume to enter into an elaborate discussion upon so comprehensive a subject, or to present the phenomena referred to as by any means conclusive, since they are far too limited and not followed, as they should have been had circumstances permitted, by closer investigation and more varied experiment. As crude observations merely they are presented, and even as such may not be devoid of interest.

It was the month of March; we had been ten days at sea, and were distant N. E. from the Bermudas about one hundred miles; the crew in good condition; a remarkable degree of health prevailing; and being on an independent cruise for blockade runners, of course all were in excellent spirits.

Before starting out from Norfolk Navy Yard it should be premised the storerooms and holds of the ship had been thoroughly aired and dried, the magazines fore and aft having been under repair.

As soon, however, as the ship began to feel the motion of the waves the fetid gas from the neglected bilge was forced up in quantity, and with per-

sistency almost intolerable. For several days the paintwork of wardroom and steerage showed its influence by an increasing darkness, and this, for some time after we had ceased to consider it even an annoyance. In spite of frequent openings of the hold beneath the wardroom, where our daily provisions were stored, no one appeared to suffer any uneasiness approaching disease. There came occasion to send to the storeroom where were kept my surplus medical stores and liquors. The door of this room opened into the hold. The man, upon presenting the articles for which he was sent, stated that everything was getting mouldy from having the door closed. That afternoon he was seized with a severe chill, eventuating in a fever of intermittent type, the first case on the ship since going into commission. Without noticing any connection between the visit and the disease, one of the wardroom servants was sent down on the following morning. That evening he, too, was attacked. Still not seeing any similarity in the cases, yet wondering to find it under such circumstances, and so far at sea, the matter rested.

One or two visited the same storerooms for some purpose during the ensuing day, but no disease followed.

A few days afterward the paymaster sent his steward to open an adjoining storeroom where was kept new clothing for the crew.

He too spoke of the mould, yet by no means as an unusual occurrence, since it is not uncommon in a closed storeroom so near the bilge. During the following day he was seized with intermittent fever. Now for the first time the similarity in the cases was noticed, and when the paymaster's clerk had been seized under precisely the same circumstances the hold in question was looked to as the point of origin of the miasm. Yet every day one or another visited the adjoining provision room in the same hold, which, however, had never been closed for more than twenty-four consecutive hours, and all continued well.

The next case called attention to the mould as in some way the cause of complaint. It was that of the paymaster himself. He brought a rope somewhat moulded, and handling it awhile replaced it as unfit for use. That afternoon occurred the premonitory chill. These cases, be it observed, were confined to the wardroom, none occurring meanwhile on the berth-deck among the men.

By this time we were arrived at Beaufort, North Carolina. I caused the bilge to be purified and completely washed with sea water.

The idea of a possible connection between the acid and the mould having occurred to me, especial care was taken to keep the storerooms closed till this was done. Afterward the rooms were opened, and though, contrary to advice, several of both officers and men entered them, drawing out boxes and trunks in which to send home mementoes from the vessels we had destroyed, only one other case of the disease occurred.

For several days we lay at Beaufort, long enough at any rate to allow

a new generation of gas, and unmindful of past experience, or not viewing the matter in a serious light, under the disappointment of unfortunate orders, no precaution was taken to keep the storerooms properly aired.

The first reminder of neglect occurred upon our arrival at Hampton Roads, when, during the process of pumping out the bilge, I visited the storerooms and found everything covered with light mould as before.

In less than twelve hours, though never before a subject of such disease, even amid unusual exposure, I was seized with chill.

The rooms after this were kept open, and a strong solution of nitrate of lead poured daily into the bilge. (Apropos to this subject might be called to mind the generally received idea that this salt counteracts only the fetid odour of sulphuretted hydrogen without neutralizing its toxical properties, an impression at least not proven).

At this time occurred the only two cases recorded on the journal, among the crew, and one of these seemed singularly enough traceable to a visit to the wardroom hold.

Two months afterward, it being the month of July, and we in James River, above Bermuda Hundred, the same phenomena were repeated; but as the nature of the locality might of itself be supposed a sufficient cause, it would be scarcely necessary to give cases in detail; yet it was before the season for intermittent, and the diseases following exposure were of a more asthenic type, malarious, but tending to remittent and typhoid.

Eight cases occurred in one week. Having at this time supervision of the Medical Department of the James River fleet, I instituted inquiries with regard to all diseases of this nature; but though nothing contradictory could be gathered, nothing of additional interest was obtained.

Cases were isolated and ambiguous, and so unreliable in a locality noted for its miasm, that the inquiry was abandoned. Now whether other circumstances may have conspired to produce the effect, or whether they may throughout have been ascribable to some totally different cause, it is impossible to say; nor yet does it by any means follow that the cause of miasmatic disease always and everywhere depends on the *same* poison. Certain it is, however, the phenomena described struck me with peculiar force.

It may be supposed strange, that no other person should have recorded such a coincidence on board ship, but this ship being known as a double-ender, was of entirely new build and class. It is not often that storerooms are placed in such relation to the hold and bilge, though an every-day occurrence to find their contents covered with mould. It is not often that mould thus formed comes so peculiarly into contact with sulphuretted hydrogen, and it is far less often that cause and effect in disease come so completely under observation.

Here, then, excluding ambiguous cases, were seven occurring under unusual circumstances, commencing at sea.

By the conformation of the ship, the growth of mould was exceedingly

common and of rapid growth. Officers and men were repeatedly exposed to its influence while in port, and with impunity, so long as the hydrosulphuric acid lay undisturbed in the bilge. Ordinary continued exposure to the gas itself, even for days, produced no effects; yet exposure to the two combined, was followed by disease. Of course other considerations do enter into the circumstances detailed, such as the long confinement of air, perhaps in itself poisonous, contents of storerooms, the susceptibilities of the men, etc., not possible to discuss at length in this paper. It may, however, be proper to state, in regard to the contents of the storerooms, that they were entirely different from each other; one containing clothing only, the other sealed bottles, and two or three officers' trunks.

Subsequent inquiries, concerning two or three other ships, has corroborated somewhat the idea here advanced, and a careful recollection and reference to experience on others of different class, tend in no way to controvert the phenomena described. I have, therefore, with apology for their incompleteness, and in apparent contradiction of what is probably the latest theory (I mean that so ably upheld by Dr. Ferguson, and approved by Dr. Bennett), ventured to present them as they are.

There are two other diseases, which being perhaps unusual in practice on shore, may be worthy a brief reference.

One an inflammatory disease of the tongue, the other peculiar to iron-clads, and termed, for want of a better name, "iron-clad fever."

A third, the "spotted fever" of late discussions, might claim a place from its comparative frequency, but would of itself demand a volume; while its phases thus far observed must be too familiar to bear repetition.

To the affection of the tongue referred to, my attention was called during the first year of the war, on board ship, then lying at the recaptured port of Norfolk, Va. Two or three cases only, however, in that year, were recorded, but during the summer of '64 they were comparatively frequent. The affection was diagnosed and treated as ordinary glossitis, arising probably from some irritating substance in food or drink, but later observation revealed a few unusual, and (because invariable) remarkable deviations from the ordinary course of that disease.

From a list of sixty cases, the following general symptoms were deduced as characteristic:—

A slight febrile movement was the initiatory symptom, with lassitude, headache, and frequently an indefinite sense of impending evil. Several cases were preceded by diarrhœa.

After a period varying from twelve to twenty-four hours, the tongue became coated, swollen, and exceedingly tender, soon the fungiform papillæ became peculiarly distinct and prominent, and in a few hours the circumvallatæ had the appearance of ulcers, covered with a thin, reddish film.

This condition continued, and the other portions of the tongue assumed an eruptive appearance, suggestive of erysipelas. The fever almost always persisted till the third day of the inflammation, when many or all of the circumvallatæ papillæ showed like so many vesicles.

The tongue was now smooth and tense, appetite gone, secretions and excretions of course somewhat deranged—undoubtedly an erysipeloid condition; the peculiarity was the appearance of the papillæ mentioned. No eruption on any other part of the body, or particular inflammation of gums or fauces was observed, at all in consonance with the condition of the tongue. The vesicular enlargement of the posterior papillæ seemed the condition of maturity or crisis. Drying and desquamation followed, yet the scales, thickened and rough as in tuberculous lepra, were adherent for several days after the decline of all other symptoms. That these vesicles were not mere blisters, was inferred from their arrangement in a wedge-like row corresponding to the locality of the papillæ. After repeated observation, the inflammatory affection was decided to be secondary to the enlargement of the papillæ, as though these had absorbed some poisonous material.

Tenderness, pain, difficulty of deglutition, etc., were, as might have been anticipated, often excessive. So invariable was the latter, that even water was refused, and an examination of the mucous follicles with which the base of the tongue is so thickly studded, was rendered impossible.

One other feature of this inflammation was the frequent occurrence of a flaking or peeling off of the mucous membrane of the tongue, leaving a raw muscular surface (apparently), but from which stood the enlarged papillæ, white and glistening like pearls. That this was a simple inflammation was disproved by the symptoms mentioned, and especially by the eruption of the first three days, but that it was dependent on some particular poison directly applied, was beyond doubt, because there existed no invariable affection of either stomach or intestines.

Pickles being a prominent article of diet, the vinegar obtained from them was examined, and, though consisting almost entirely of dilute sulphuric acid, was too common an adulteration in all localities to merit even suspicion. The other articles of food, the ship's coppers, water tanks, etc., were carefully examined, and last and most carefully, the ship's tobacco. Here was found sulphate of copper, sulphate of iron, *arsenic*, and some form of sugar, with a substance impossible to decide upon from lack of proper chemical apparatus. That the poison existed here seemed to be shown by the fact that in every case the patient was addicted to the use of tobacco, but chiefly that the opening of a new box was always the immediate forerunner of an outbreak or increase, yet, on the other hand, not a case occurred among the officers using the same article.

An additional fact was noticed, though perhaps accidental, and that, that the name of the same man does not occur twice on the journal for treatment.

The duration was also noticeable, varying not forty-eight hours from eight days.

As might be expected, few surgeons had regarded the disease as other than mere glossitis of erysipeloid type and epidemic.

Essentially correct, of course, yet as much an error as to confound the fleeting blush of urticaria with the painful glow that follows the application of an epispastic. A few, however, were more observing, and the conclusion arrived at was, "that the affection commenced in the mucous follicles of the base of the tongue; that the condition of papillæ, the eruption and inflammation, were ascribable to the absorption of an uncertain yet constant poison used in the packing of navy tobacco. Concerning the nature of this poison there were none but surmises, the presence of arsenic, the sulphate of iron and of copper being regarded as not positively sufficient to produce the phenomena.

To complete the subject, the leading points of the third and last disease to be considered shall be presented as concisely as possible, viz., "Iron-clad Fever." As a disease it is probably no longer known, the various improvements upon that class of vessels having ended its career; yet to those who sailed in the first monitors afloat it was not only strange but alarming in its progress and fatality. The initiatory symptoms were those of typhus, but before the end of the fourth day, and before the establishment of any marked depressed condition there commenced a severe headache confined to the back of the head, and when this was severe, within a few hours complete aphonia.

So prominent was this that it came to constitute the leading feature of the disease. It came on suddenly, often unheralded, and was usually a fatal prognostic. In my own cases there was no serious difficulty of deglutition, and no very severe dyspnœa, though the testimony of several other surgeons was at variance with this statement in a few instances. From the occurrence of this complication, if complete, the disease made rapid strides. Delirium evinced by eye and expression of every feature, running rapidly into coma, the coma into death.

Remedies, after a few days, seemed worse than useless, nor to any treatment indeed could a favourable issue be clearly traced.

Partial or complete absence of aphonia was of favourable augury, and in the few patients in which this was the case, recovery was hoped for, though invariably slow and tedious.

The pulse and tongue were those of typhus, but there was none of the peculiar eruption. Cerebro-spinal meningitis was suggested, and also spotted fever (considered by many as synonymous terms) but in no case appeared the faintest indication of the eruption of the latter affection. The number that came under my personal observation did not exceed ten, and I

was informed by the surgeon of the monitor Patapsco, that all the cases were confined to the first five or six iron-clads that were sent to sea.

Aphonia being deemed somewhat characteristic of the disease, opportunity for autopsy was eagerly looked for. Owing to the demands and changes of war, this did not occur for some time; yet, at last, the bodies of two sailors (I think from the Weehawken) were taken on shore at Port Royal, and examined.

The idea of inflammatory lesion or other affection of the larynx itself, was considered as possible, yet calling to mind the then late discoveries in regard to the action of the communicating branch of the spinal accessory upon the larynx, it was suggested, if no other evident cause of aphonia should appear, carefully to examine that nerve to its origin, as well as, of course, the laryngeal branches of the pneumogastric, the medulla, and cerebellum. The larynx of each case was opened, and found in a congested but not inflamed state. With great care and patience, during a laborious dissection, both laryngeal branches of the pneumogastric and this nerve itself, together with even the communicating branches of the twelfth pair, were examined without result. The cerebrum and cerebellum were also carefully dissected, and in the latter was found the first evidence of disease; there was congestion of the vessels of the pia mater. Proceeding downward, the lateral tracts of the cord, in the vicinity of the olivary bodies, were found slightly softened, and dissecting, as previously designed, down the course of the spinal accessory, and examining more minutely the superior laryngeal, there was found a knotted thickening of the neurilemma, similar to that which often arises in the tubular membrane of cerebral nerves, under pressure or rude manipulation, and upon examination shortly afterward, with greater magnifying power, a discoloration of the axis cylinder (or perhaps discoloration of some of the fibres of the funiculi themselves) was found.

This, in both cases, was essentially similar. The examination was not confined to this locality. All important organs were removed, and intestines opened at various points. No other peculiar appearances were recorded that could in any way bear upon the disease or its leading symptom.

The question then arose as to its origin. That it was peculiar to iron-clads seemed evident, and the imperfect ventilation, with presence of large quantities of both salt and iron in our drinking-water—the iron, indeed, so great, as to render it at times as dark as coffee, were the points to which especial importance was attached. The disappearance of the affection, when ventilation was improved and care taken to have the water somewhat freed from its impurities, seemed to favour the suspicion, but unfortunately ended speculation by summarily disposing of the disease.

Typhus in one or two instances, and typhoid in many, did indeed occur, but the symptoms in the other cases invariably were absent, and the diseases ran their usual course. To the many surgeons of both army and

navy who were observers of cases, and of the dissections referred to, familiar as many of them were with typhus and typhoid in all their modifications, and in various climates, this disease was pronounced a stranger, and it is to be regretted that more numerous post-mortem examinations could not have been had, and better opportunities presented for observation and record. As before stated, it was not experienced in any but the first detachment of the iron-clad fleet. The whole number of cases possible to collect was between thirty and forty, and of recoveries among these, only six. Treatment was conducted upon general principles. The persons seized were of no peculiar habits or temperament, though it is but proper to state, what might be anticipated under the circumstances, the whole crew had soon become enervated and sickly. Diarrhœa, bronchitis, and an indescribable adynamic condition, with indefinite symptoms, were frequent.

The last division of this article is offered—though I am fully conscious of its incompleteness—that it may at least furnish data for comparison, should the future ever present cases of similar nature.

ART. IV.—*Comparative Advantages of Pirogoff's, Syme's, and Chopart's Amputations, and Excision of the Ankle-Joint, by Hancock's Method, after Gunshot Wounds and other Injuries; with Reports of Cases, and the Results; and proposing another Method for Excision of the Ankle-Joint.* By JAMES M. HOLLOWAY, M. D., Prof. of Anatomy in the University of Louisville, Ky.

THE April number of the London *Lancet*, for 1863, contains an interesting article, by HENRY HANCOCK, Esq., on the "Superiority of Chopart's Operation, and Excision of the Ankle-Joint." A comparison is instituted between these operations and those of Syme and Pirogoff, in which he decides in favour of the two first. As his experience, embraced by this article, is confined to the domain of civil surgery, it may not be uninteresting to pursue the subject still further, and see wherein his views are applicable to the class of injuries most usually encountered by the military surgeon. I will confine myself exclusively to the notice of those cases which came directly under my observation, and in which I was allowed the opportunity of seeing the final results. These reports will show that Pirogoff's and Syme's operations have not generally proved favourable, owing to various causes to be hereinafter mentioned. It is impossible to determine as to the propriety of the operation in each case, since most of them were performed previous to admission into hospital, and were unaccompanied by explanatory reports. Certain it is, however, that they were skilfully performed, and, as a general rule, were well cared for in their subsequent

management. It will be seen that, in Pirogoff's operation, the non-union between the coaptated surfaces of the calcis and tibia was one cause of failure—the retraction of the heel, and corresponding depression of the anterior aspect of the stump, thereby throwing the cicatrix upon the sole, another cause. Inflammation of the sheaths of the tendons was not observed in most of the cases; in others, where this complication did exist, it did not impress me as being so serious an interference as Mr. Hancock found it. In one case, to be mentioned hereafter, these abscesses along the sheaths of the tendons were secondary to caries and necrosis of the sawn extremities of the bones, which caries and necrosis terminated in complete disintegration of the calcis and the spongy structure of the tarsal extremity of the tibia.

CASE I. A. B., a soldier, in good health, aged about 24 years, wounded in the fall of 1863, either at Chattanooga or Missionary Ridge; submitted to Pirogoff's amputation a few days afterwards; operation performed by Prof. Paul F. Eve, of Nashville, Tenn. The case was seen by me, for the first time, in the latter part of January, 1864. The flaps had united, but a number of sinuses communicated with the coaptated surfaces of the calcis and tibia, at the bottom of which denuded bone could be felt upon introduction of the probe. In addition to these, other sinuses, situated on the lateral aspects of the lower third of the leg, communicated with the sheaths of the tendons. These latter, as far as I could judge from the statements of the patient, appeared subsequent to those leading to the carious bones. The integuments overlying and adjacent to the diseased bone and inflamed condition of the sheaths of the tendons, presented a remarkably healthy appearance, so much so that the true condition of the stump did not transpire until a more thorough examination was made, while the patient was under the influence of chloroform. Such was the complete disintegration of the calcis and the end of the tibia, that amputation of the leg was necessary. This was done early in the month of February by Dr. Richard Taylor, of Memphis.

CASE II. R. H. Holland, Corporal, Co. B, 44th Regiment, wounded at Chancellorsville, on May 3d, 1863; submitted to Pirogoff's operation. Upon examination, on the 8th of July, 1864, fourteen months afterwards, I found the stump healed, but the parts were still swollen and œdematous; unable to walk without two crutches; heel drawn upwards, and cicatrix of flap thrown downwards and forwards, so that during locomotion it came in contact with the floor. No traces of the existence of inflammation of the sheaths of the tendons remained, and the bones seemed to be sound.

CASE III. V. B. Clark, private, Co. B, 12th Regiment, wounded near Spottsylvania C. H., May 10th, 1864; submitted to Pirogoff's amputation. On July 20th, 71 days afterwards, the soldier was able to proceed to his home in Georgia, though the stump had not entirely healed, and considerable tumefaction of the stump and leg still existed. The heel was drawn up, as in the above-named cases, and the tender cicatrix constituted a part of the sole of the stump.

I remember three other cases, of which I made no record at the time. One in which there was a double amputation performed on the field, by

Dr. John Taylor Gilmore, of Mississippi. Pirogoff's operation was done on one foot, and amputation of the other leg, I think, by Lenoir's method. The man died, but not before the flaps of the former operation had sloughed. In the two other cases, the cicatrices were thrown forwards and downwards by the retraction of the heel. The parts had healed, but the condition of the stump was not favourable for easy and painless locomotion.

I have seen only two cases of Syme's amputation, in both of which there was a bulbous condition of the stump, arising mainly from inflammation of the surrounding soft parts; the integument over the extremity of the bones was attenuated, adherent thereto, and presented a glazed appearance. It appeared to me that these cases promised unfavourably for the useful adaptation of an artificial foot. Amputation of the leg in its lower third would have been more propitious for easy locomotion.

I have recorded only one case of Chopart's amputation, rendered necessary by reason of a gunshot wound. I have examined others in which the results were equally as favourable as this one. In none of them had the tendo-Achilles been cut for the purpose advocated by Mr. Hancock.

CASE IV. John Shea, Letcher's Battery, aged about 45 years, wounded by shell on the 13th Dec. 1863, at Fredericksburg, requiring Chopart's amputation of left foot. Upon examination, on the 12th Dec. 1864, twelve months afterwards, the stump was perfectly sound; the tendo-Achilles had not been severed, and there was no retraction of the heel. He was on duty at that time as clerk in the Quartermaster's Department, and upon the morning that I made this note of the case, he had walked about two miles without pain.

The following is the history of a case in which I performed Chopart's operation during the fall of 1859, while a resident of Madison County, Mississippi:—

CASE V. Amos, servant of my partner, Dr. Thomas A. Phillips, aged 18 years; health vigorous; weight about 160 lbs.; complexion dark. On Saturday evening, about five o'clock, in the month of September, 1859, while in the act of rolling a bale of cotton from under the press, the "follower block," weighing about 100 lbs., fell the distance of eight feet, upon the heel of his left foot, almost the entire weight of his body resting, at that moment, upon the toes and ball. Upon examination, one hour afterwards, pulse depressed, extremities cold, pain in foot severe; bones of the metatarsus and tarsus, excepting the astragalus and calcis, badly crushed; integument on dorsal aspect, as high as the annular ligament, contused and lacerated. Having administered stimulants, he was conveyed to his quarters, distant about one mile; cold water dressings applied; a full anodyne administered; reaction not being fully established, night approaching, and the absence of surgical appliances, induced us to postpone further interference until the next morning.

Sunday, 10 A. M. Operation, seventeen hours after receipt of injury. Pulse 100; reaction complete; feverish; slept at intervals during the night; considerable swelling at seat of injury, extending up the leg; pain not intense. After the administration of a stimulant, chloroform was inhaled. The

limb being supported by an assistant, I speedily disarticulated the scaphoid and cuboid bones from their posterior attachments, not regarding the preservation of an anterior, semicircular flap, because of the lacerated condition of the soft parts over the instep. The next step was to pass the catlin closely under the extremities of the detached tarsal bones, and include in the posterior flap all the tissues of the plantar aspect of the foot, extending the incision beyond the base of the toes. This completed the operation. No vessels required ligation. The flap was turned up and adjusted by interrupted sutures and adhesive strips to the lacerated soft parts on instep, and a retention bandage applied. The limb was elevated and supported by pillows, and cold applications ordered to be persisted in. Owing to the sthenic condition of the patient, febrile excitement ran high for three days, requiring prompt antiphlogistication. When the dressings were removed, the flap was found to be adherent throughout almost its entire extent. A small slough over instep, at site of laceration, was detached. From this time, repair progressed without interruption, and, in about four months, the boy was able to walk about with the aid of a crutch. A well-fitted shoe enabled him to use a hoe to an advantage. When I last saw him, in 1861, he was acting as teamster. The heel was very prominent, as is usual in the genuine African, which condition left him about four and a half or five inches of sole. The tendo-Achilles was not severed, and there was no retraction of the heel.[1]

I am not prepared to concur with Mr. Hancock as to the importance of this latter step in the operation. Careful examination of a number of cases operated upon by others, in which section of the tendo-Achilles was omitted, did not manifest the retraction of the heel, so particularly alluded to. Nevertheless, the authority for it is so distinguished, and the procedure so simple and safe, that no serious objection can be urged against it. From its omission in Pirogoff's operation, I have observed another bad effect—aside from affording, in some cases, a direct mechanical hindrance to the proper coaptation of the calcis with the tibia—viz., causing the cicatrix of incision to occupy the dependent portion of the stump. The reason why this should occur more often in the latter operation than in the former is obvious. In the latter, all the tarsal bones, except a portion of the calcis, have been removed. This fragment, moreover, has been carried forcibly forwards, out of its normal position, in order to coaptate the sawn surfaces of bone. All the tendons of the flexor and extensor muscles of the foot and leg, excepting the tendo-Achilles, have been severed—in front, above the tarsal extremity of the tibia; behind, on a line with the malleoli. In consequence thereof, being drawn still further up by muscular contraction, little chance is left for the formation of new attachments. In the former, on the other hand, the astragalus and calcis are left entire and *in situ*, the lateral ligaments of the tibio-tarsal articulation, also the anterior ligament,

[1] A letter from Dr. P., dated August 10th, 1865, contains the following: "You 'll remember the boy Amos, upon whom you performed Chopart's operation? He is nearly as useful as before; indeed, there is no kind of work which he cannot do with ease. He possesses a perfectly sound and healthy stump."

remain undivided; the sheaths and tendons of the various groups of muscles have been severed some distance below the tarsal articulation, thereby affording an opportunity for the formation of attachments that will exert a powerful counteracting influence to the retraction of the tendo-Achilles. Until such an influence is established, retraction of the heel can usually be overcome by flexion of the leg and elevation of the limb, and the employment of retentive apparatus.

I entertain the opinion that very few cases of injury (gunshot or otherwise) of the ankle-joint are met with in which excision is admissible. A large number recover, with useful limbs, without operation, and, in some cases, with remarkably free motion of the joint; and even where the tibio-tarsal articulation is fixed, increased compensatory motion of the tarsal and metatarsal joints occurs. I remember one case, particularly, in which the ball traversed the joint laterally (it must have been while the foot was extended upon the leg, and the anterior ligament was on the stretch); synovia flowed freely from the internal orifice; repair was effected without suppuration. Another case, wounded Sept. 19th, at Chattanooga, ball lodged in joint, beneath the anterior ligament. Inflammation ran high, and anchylosis resulted, with slight talipes equinus. During the following August, 1864, I removed the ball, by enlarging the sinus on instep. The healthy condition of the end of the tibia was surprising, the ball having lain in contact with it for nearly twelve months. The only immediate inconvenience resulting from its presence, was the repeated formation and discharge of small abscesses.

CASE VI. J. G. Clayton, private, 24th Regiment, Co. I, shoemaker, aged 22 years, wounded at Drury's Bluff, May 16, 1864. Gunshot wound, ball impinging upon lower end of tibia of left leg, glanced downwards, and passing through the anterior aspect of the ankle-joint, lodged under the skin over the neck of the astragalus. It was extracted on the 18th, two days afterwards. With the assistance of the rammer of his gun, he was able to walk to the rear.

May 23. Foot and ankle inflamed and swollen; pain excruciating upon slightest motion; grating of inflamed articular surfaces distinct; pulse frequent and irritable Ordered cold irrigation and anodynes.

June 1. After free incisions to favour the escape of confined pus (with which synovial fluid was freely mingled), and the persistent employment of cold irrigation, and anodynes, and suitable diet, the local inflammation has been subdued, and the general condition of patient is more favourable, though his appetite is somewhat capricious, and his digestive organs deranged. Abscesses in the neighbourhood of the joint continue to form and to be discharged; grating upon motion still distinct.

25*th.* Removed to private quarters to-day. Inflammation entirely subsided; motion of joint imperfect; general health much improved.

January, 1865. The patient still has imperfect motion of the joint, but is able to walk with the aid of a cane: wounds all closed.

In cases where the injury to the bones composing the articulation is more extensive, the ball, in its transit, making either a clean track through,

or producing comminution of them, their spongy structure renders them peculiarly liable to rapid disintegration, extending oftentimes, before we are aware of it, to the contiguous bones. Under ordinary circumstances, it is impossible to appreciate the extent of this destructive process by the introduction of the probe, or by the appearance of the skin and soft parts. For in such injuries, as in most diseases, very little analogy exists between the condition of adjacent structures. While inflammation of one is in rapid progress, the other may enjoy a comparative exemption. Free incisions, to allow thorough exploration of the injured parts, are the only means by which the propriety of the operation can be determined. It may be that primary excision of this joint would be advisable, where the facilities for subsequent transportation are good, or what would be much better, where the patient could remain at the field infirmary, and obtain all necessary comforts and suitable diet. The experience afforded by this war, however, will show that primary excisions of the lower extremities have proved unsuccessful, owing possibly, in a measure, to the absence of these requisites. Such cases, consequently, come most frequently under the notice of the hospital surgeon, and he has to deal with them in their pathological condition. Mr. Hancock's remarkable success in the five cases he reports should impress us with the importance of a most thorough examination of each case, with a view to excision, before deciding upon amputation.

Great interest was manifested by myself and a number of my colleagues in the following case, which, for many days, was regarded as most favourable for excision. It will be seen how delusive were our hopes, so soon as the condition of the patient admitted of a thorough examination of the parts.

CASE VII. S. H. Rawls, private, 11th Regiment, Co. D, general health good, aged about 24 years. On the 23d Oct. 1864, fell from a bridge, a distance of about forty feet, lighting directly upon his feet. The force of the fall was unequally distributed, and, in consequence, the right ankle was severely crushed, while the left escaped with a slight sprain. High inflammatory excitement followed, placing his life in great peril. The symptoms abated about the thirtieth day, leaving him very much prostrated. Abscesses formed in the neighbourhood of the joint, involving the sheaths of the tendons. A constant discharge of pus flowed through numerous sinuses which communicated with the joint. A vertical section of the outer half of the articular surface of the astragalus came away in January, 1864. Cold applications, alternating with poultices, were employed, together with the usual supporting treatment. My attention was called to the case about the 10th of January. The attending physician stated that the patient had been declining for two weeks; experienced an exacerbation of fever daily; abscesses were forming in rapid succession, and the drainage of pus was very profuse. Upon examination, I found a number of sinuses communicating with the joint, and quite a free opening over the external malleolus, through which the large fragment of the astragalus had escaped. This was the only fragment of bone that had come away. The surrounding soft parts were infiltrated and tumefied, pitting upon pressure; the tumefaction

was limited to the parts immediately around the joint, only slight œdema of the metatarsus and leg being observed. Except during the formation of an abscess, he was free from pain; a dull, aching sensation followed motion of the joint or the introduction of the probe; the probe passed freely through the joint, emerging through sinuses on the opposite side; very little roughness could be felt, and that confined to the anterior portion of the joint; above, and behind, and below, the end of the probe glided smoothly over the opposing surfaces. The case seemed favourable for excision, and upon consultation with Prof. Peticolas, Drs. Palmer, Rives, and others, it was decided that the patient's general condition should be improved, and when he was in a condition to undergo an operation, free incisions should be made, with a view to ascertain the exact condition of the bones composing the joint, and be guided thereby in the selection of the operation. Accordingly, on the 4th of March, 1865 (four months and ten days after receipt of injury), the general condition of the patient having improved, he was placed upon the table, given a stimulant, and anæsthesia produced. The sinus on external aspect of the joint was enlarged by a curvilinear incision, and the parts explored with the finger. Only a small fragment of the astragalus remained, the rest having come away by particles; the calcis was invaded, and the cuboid and scaphoid bones were in a softened condition; the ends of the tibia and fibula were inflamed, and both malleoli, fractured by the fall, had reunited; the periosteum was entire, and a part of the cartilage which entered into the formation of the tibio-tarsal joint remained. The extent of the caries and necrosis dissipated all hopes for excision, and the leg was amputated in the lower third by Lenoir's method. It is not improbable, if the condition of the injured parts had been critically examined at an earlier date, that the caries and necrosis would have been found to involve only those bones which constitute the joint, and which had suffered primarily from the force of the fall.

On the 21st of June, 1864, I excised the ankle-joint by Hancock's method. The following is a history of the case:—

CASE VIII. J. T. McGuiffin, private, Co. B, 24th Regiment, farmer, aged 23 years, general health good, fair complexion, hazel eyes, dark hair, wounded May 16, 1864, at Drury's Bluff. Gunshot wound (minié) of right ankle-joint, ball entering in front of and on a line with internal malleolus, passed through astragalus, and made its exit through external malleolus, carrying with it a number of fragments; synovia escaped. Also, gunshot wound, fracturing fourth metatarsal bone of right foot.

May 23. Very feeble and exhausted from constant pain, restlessness, and loss of sleep; foot and ankle inflamed and swollen; spicula of bone presenting at orifice of exit; abscesses forming around and involving the joint. Directed cold irrigation; limb suspended in Smith's anterior splint, to allow motion of body without disturbing injury; grating distinct in joint upon the least movement. Amputation of the limb, advisable as a primary operation, was not admissible at this date.

26*th.* Opened abscesses on internal aspect, which discharged pus freely, mingled with synovia; also another one connected with injury to the metatarsal bone; continue ice-water irrigation.

June 1. Parts still swollen and inflamed; discharge of pus free; abscesses still forming; spicula of bone removed from day to day, as they become detached; appetite capricious; sleep unrefreshing; pulse frequent

and irritable; fever constant. Anodynes, and such nourishment and stimulants as are tolerated.

3*d*. Swelling and tension somewhat subsided; irritative fever continues; discharge of pus free from abscesses and wound of exit; cold drip constantly applied. F. D. and anodynes to secure rest.

6*th*. Substituted linseed poultices in place of cold irrigation, and turned foot upon its outer side, so as to admit of free drainage.

7*th*. Heat and swelling subsided after copious discharge of pus, with marked relief from pain; passed a comfortable night; continue poultices, to be renewed every six hours.

8*th*. Removed a number of small fragments from wound of exit; quite a large, loose fragment felt under the skin on dorsum; pulse still irritable.

10*th*. Discontinue poultices; dress wounds with cerate, and apply roller bandage; more comfortable; wound of exit discharging freely; no spicula presenting.

11*th*. Slight increase of heat since removal of poultices; complains of pain in leg; discharge still free; sitting up in bed; continue cerate dressings and bandages.

13*th*. Removed several small fragments of bone from wound of entrance; all the openings filling up by granulation; discharge encouraged by keeping orifice of exit patulous; marked improvement in general health; cheerful, rests well, and begins to relish his diet.

18*th*. Considerable heat and swelling (œdematous) came on suddenly; required constant cold bathing to subdue pain; discharge of pus diminished but still benign; probe passes freely through astragalus; fever, with intense thirst; granulations in orifice of exit luxuriant, and bleed upon least irritation; glands in right groin enlarged; bandaged ankle and foot tightly, and painted glands with tincture of iodine; stimulants and nutritious diet.

19*th*. Found patient more comfortable; passed tolerable night; no chill, the occurrence of which is apprehended; fever and pain subsided; a streak along course of lymphatics (superficial) on internal aspect of leg and thigh, extending from ankle to enlarged glands, not visible throughout, but traced by stinging sensation upon slightest pressure; œdema reduced by bandaging; discharge of pus more copious; no evidence of the formation of abscesses.

21*st*. Upon consultation with Drs. Habersham, Browne, and Baylor, Hancock's excision of the ankle-joint was agreed upon.

Operation, June 21*st*, 4 P. M. Patient was directed to abstain from food, but it was ascertained subsequently, by ocular evidence, that he had eaten heartily at 2 o'clock P. M. Chloroform administered by and under the superintendence of Drs. Wiley and Habersham. Yielded readily to the influence of the anæsthetic. The directions of Mr. Hancock were followed as closely as the peculiarities of the case would allow. An incision was commenced two inches above and behind the external malleolus, and carried across the instep to the point behind and two inches above the internal malleolus. This flap, including the skin only, was carefully reflected. The fibula was exposed by detaching the peronei tendons from their sheath and groove; the lateral ligaments had been severed by the ball, and the greater portion of the external malleolus carried away. With a pair of strong nippers, the bone was severed about one and a quarter inch above the end and removed. This was effected with difficulty, because of the inacces-

sibility of the interosseous ligaments. The foot was then turned upon its outer side, with a view to the isolation of the end of the tibia, when it was suddenly announced that the patient was pulseless; vomiting occurred, and a large quantity of undigested food was ejected. It was ascertained, by examination of the receptacle, that, up to this moment, the patient had lost only about six ounces of blood; neither vein nor artery had been severed. The operation was suspended, and efforts were made to bring about reaction by the application of sinapisms to epigastrium, wrists, and inside of thighs, and the administration of ammoniæ carbonatis, and whiskey per rectum, and hot toddy by the mouth. After the lapse of forty-five minutes, no visible reaction occurring beyond increased sensibility and an occasional pulse at the wrist, it was thought best to complete the operation without delay. Accordingly the tendons of the flexor sublimis and tibialis posticus were carefully detached, the internal lateral ligaments severed, the foot forcibly dislocated outwards, and one inch of the end of the tibia removed. The foot was turned down, a bandage passed in front of tendons, nerves, and vessels, was drawn firmly backwards to secure them from injury, and the greater portion of the astragalus, not including its neck, was removed with a metacarpal saw. The operation was completed without injury to nerve, vein, artery, or tendon. The flap over instep was replaced, and secured by interrupted sutures, the lateral incisions left open, and the limb fixed upon a T-splint, and bandages loosely applied. The patient was not removed from the table; strong, black coffee, alternating with milk-punch, was administered every twenty minutes. 11 P. M., pulse more distinct, and extremities warmer; very restless; gave half a grain of morphia, and repeated in a half hour; after this he slept at intervals during the night, and at 7 A. M. the next day he was rational; vomiting ceased; pulse distinct, and, with an assistant to conduct the maimed limb, was able to move himself from the table to a litter, and from the litter to his bed.

June 22. Toes cold; absence of sensation; complete stasis in circulation. Ordered gentle friction; turpentine stupes and bottles of hot water. Removed dressings, and found sensation perfect as far as base of the metatarsus, except in the skin flap on dorsum, which has commenced to slough; the subjacent tissues are active. The bloodvessels having been uninjured, I am convinced that the imperfect circulation in the foot is owing to his asthenic condition (the other foot is cold), and the bad effects of the chloroform which may, in a measure, be attributed to an overloaded stomach, and the severe shock incurred by the completion of the operation without anæsthesia. Evening: pulse distinct at the wrist, but feeble and quick; occasional clammy sweats; voice strong; respiration regular, and without sighing; intellect clear, and mind tranquil. Ordered French brandy every two hours, with chicken soup and buttermilk.

23*d*. Slept well during the night until 1 A. M, then became restless; occasional delirium; skin flap on dorsum sloughed and removed; wounds unhealthy; clots and thin sanies discharging; gangrene of the toes in progress. Egg-nog and nutritious diet.

24*th*. Transferred to tent this morning; tissues over instep active and sensitive; the line of demarcation encircles foot below instep, including the heel. Continue supporting treatment.

25*th*. Until late yesterday the patient seemed to be more comfortable; for supper he relished a large glass of buttermilk. Ordered morphia to secure rest. Patient died suddenly and unexpectedly to the attendants at 6 o'clock this morning. I could not ascertain the immediate cause of

the sudden change. It was hoped that his condition would in a few days be favourable for amputation of the limb, which would have been done in the first place, if the patient could have borne the loss of blood usually encountered.

In conclusion, I will notice briefly the particular method by which Mr. Hancock performs excision of the ankle-joint, and suggest a modification. His rules were strictly followed in the case above described. As a particular step in the operation, he directs that the lateral incisions behind the malleoli be connected by an incision across the instep, merely dividing the skin, and that this flap must be reflected. This incision through the skin, and consequent reflection of the flap, is, in my opinion, altogether unnecessary, and for that reason, amongst others, must be, in accordance with general rules, hurtful. The object of this incision and reflection of flap is presumed to be, to increase the size of that part of the aperture through which the tibia is exposed and isolated by forcible eversion of the foot. But this presumption is not correct, for repeated and careful experiments upon the cadaver during the past winter, in presence of Prof. A. E Peticolas and Dr. H. L. Thomas, of the Medical College of Virginia, go to prove that the incisions, as described by Moreau, Sen., afford ample room for the facile accomplishment of every step required during the whole procedure. Furthermore, Mr. Hancock cautions the operator to be careful to avoid wounding the dorsalis pedis artery, and to include in this incision nothing but the skin. Consequently, after the flap has been reflected, we still have in front of the joint, and lying in contact with the end of the tibia, the anterior group of tendons, their sheaths, the confining ligament, and aponeurotic expansion, all of which clearly offer greater impediments to the isolation of the bone than the mere skin. I object, then, to this part of the operation, because, as stated above, it does not facilitate the isolation of the bone, nor secure ampler space for manipulation; also because of the danger of wounding the dorsalis pedis artery, which, to my knowledge, was severed by an experienced and skilful operator during the performance of the operation; also because of liability of the sloughing of the flap, as occurred in Case VIII.; and because, finally, even where the risks, named above, have been avoided, and a successful result ensues, a cicatrix is left upon a prominent point which will, to say the least, render the wearing of a shoe very uncomfortable.

I would, then, suggest that this part of the operation be omitted, and that the incisions be made as follows, viz: longitudinal incisions close to the posterior border of the fibula and tibia, commencing from two to three inches above the malleoli; from the inferior edges of these make others directly forwards at right angles, extending on the outer aspect of the foot, as far as the tendon of the peroneus brevis; on the inner aspect, as far as the tendon of the tibialis anticus. By dissecting up these angular flaps, we have ample room for the removal of the end of the fibula by the bone-pliers,

the eversion of the foot, and consequent isolation and removal of the end of the tibia. The subsequent removal of the injured portions of the astragalus, or, if necessary, the whole of it, will be comparatively easy.

In justice to myself, I should state that the experiments upon the cadaver, which lead to these conclusions, were instituted without any knowledge of the operation as laid down by the elder Moreau, although alluded to by Mr. Hancock in his article. Subsequently, while searching for information upon this subject, with a view to the preparation of this article, I came across the procedure of the elder Moreau in Malgaigne's *Operative Surgery*. It will be observed, by referring to it, that he does not recommend the eversion of the foot in order to facilitate the removal of the end of the tibia. For this latter modification, and the connection of the vertical incisions across the instep, we are indebted to Mr. Hancock. The one I deem an important improvement. In regard to the other, I am sure, upon reflection, Mr. H. will agree with me that it is entirely unnecessary, and, in consequence, unwarrantable.

ART. V.—*On Symptomatic Bronchial Irritation.* By A. P. MERRILL, M. D., of New York City.

OF the number and severity of diseases of the respiratory organs which cause great mortality, a larger proportion than is generally supposed have their origin in derangements of the digestive and uterine systems, of which they are symptomatic. These cases simulate bronchial irritation from other causes so closely, that it is not always an easy matter to discriminate between the idiopathic and symptomatic affections, and the disease in both forms is often mistaken, in its latter stages, for tubercular phthisis. Not unfrequently is it the case, indeed, that in strumous subjects the predisposition to tubercular phthisis finds its development in the influence of bronchial irritation as an exciting cause, and without which such predisposition might have lain dormant for a lifetime. The prostration of vital energy which is the common effect of mucous disease under every form, is well calculated to invite this development of phthisis, which is only restrained in tubercular subjects by invigoration and tonicity. Hence the frequent occurrence of tubercular phthisis as a sequela of enteric or typhoid fever, especially if active disease of the mucous tissue be long continued.

Symptomatic bronchial irritation generally has its origin in various causes acting previously upon the mucous membrane of the digestive organs. An undue and long-continued indulgence in the use of stimulating food, alcoholic drinks, tobacco, opium, capsicum, and all those indulgences and ex-

cesses common to good living, tend to derange the functions of the mucous membrane of the digestive organs, causing indigestion, disorder of the bowels, and general debility, with vitiated secretions throughout the intestinal tube, and resulting in bronchial irritation as a symptomatic affection, which is likely to lead rapidly to a fatal result.

More commonly still, perhaps, are those primary derangements of the mucous tissues due to sedentary and inactive habits of life, causing an undue determination of blood to certain abdominal viscera, and consequent congestion of the mucous membranes lining those viscera, and this is followed sooner or later by a similar condition in the linings of the bronchi under the influence of sympathy. Numerous classes suffer in this way. Men who are confined to the labours of the counting-house, whether sitting or standing, or in sedentary mechanical labour, whatever may be their habits in regard to eating and drinking, are very liable to suffer from indigestion and constipation. More commonly still do women of sedentary habits, sewing girls who sit at their work in close and overheated rooms twelve or thirteen hours a day, and factory girls whose occupation requires them to stand an equal length of time, contract habitual constipation, accompanied by great torpor and hyperæmia of the mucous membrane of the colon and rectum. In females this condition is soon communicated by sympathy, to the mucous membranes of the organs of generation, causing first excessive, then deficient, and finally a total suspension of menstruation, subtituting those serous exudations which generally accompany hyperæmia of the mucous membranes. In all these cases of disorder arising from vicious habits, the powers of digestion are impaired, and the irritation produced in the mucous membrane of the digestive organs and uterus, is communicated to the sympathizing mucous tissue of the bronchial tubes, and the subject lingers and dies, a victim to imprudence and neglect.

I have mentioned the habitual use of tobacco as one of the causes of disease in the mucous tissues, and we have abundant proof that they who use it by chewing, smoking, and snuffing are sufficiently punished for the unnatural indulgence, by impairment of health. But there is a more injurious method than any of these, in which tobacco is habitually used, and which has not been sufficiently noticed by medical authors. It is commonly called "*dipping.*" There is a large portion of the Southern States, embracing North and South Carolina, Tennessee, the northern parts of Georgia, Alabama, Mississippi and Louisiana, all of Arkansas, and a considerable portion of Texas, in which this habit prevails among females, and is handed down from mother to daughter as a hereditary curse. It is confined, so far as I have observed, to the female sex, and consists in applying snuff, mostly fine Scotch snuff, to the teeth and gums by means of a sort of brush made of a stick or a piece of hickory bark, chewed into a brush-like form at one end. This is moistened, dipped into the dry snuff, and thus the powder is conveyed into the mouth in any quantity desired. Those who

have been long addicted to the habit carry the brush pretty constantly in the mouth with one end projecting from the lips.

The better classes are more careful to escape observation, but the habit grows upon those who indulge in it until it becomes the most inveterate of any connected with the use of narcotics. Reformations are exceedingly rare, and the victims find it difficult to substitute the use of tobacco in any other form. Chewing, smoking, and snuffing will not satisfy the cravings of the unnatural appetite. The mucous membrane of the whole intestinal canal becomes plastered with a pasty coating of snuff-powder, as I have ascertained by autopsic examination, and it seems necessary that this coating be maintained or a state of wretchedness ensues which greatly unsettles the mind. The skin after a while assumes very nearly the colour of the snuff, so that from this alone dippers are readily distinguished. The circulation of blood in the skin becomes sluggish, no longer responding readily to displacement by pressure, or to that nervous influence which causes the modest blush. The conjunctivæ are also tinged by the colouring matter of tobacco, and the vision of youth prematurely fails. Deafness is not an uncommon effect of this habit, and the whole nervous system appears so impaired in healthful vigour, as to affect every sense and every function of the body.

The mucous membrane of the internal organs of generation becomes diseased and the uterine functions impaired. The cervix and body of the uterus are swollen, while the vagina and suspensory ligaments are relaxed, giving rise to prolapsus and other displacements. Miscarriages are common, child-bearing sometimes ceases entirely, and there is reason to believe that children born of such women rarely fail to suffer, both in body and mind, the degenerating influences of this vicious habit of their mothers.

In nearly all these cases the stomach performs its office imperfectly, and the woman is subject to obstinate fits of indigestion and vomiting, ejecting not only the food and secretions, but the snuff which has accumulated in that organ. The bowels are torpid and habitually constipated, with occasional alternations of diarrhœa. The secretions are vitiated and mostly discoloured, like the skin and mucous membranes. The mind becomes irritable, dejected, and perverted, causing discontent and unhappiness, and the whole system is debilitated, with emaciation and œdematous swellings. Remedial measures fail to produce anything more than temporary relief while the cause of all this disorder is continued, and, as in other cases of nervous and functional disturbance of the mucous tissues, the life of the patient is sometimes ended by tubercular phthisis, or by symptomatic bronchial irritation closely simulating that dreadful disease; and in either case the term consumption is applied.

Independent of the influence of this vicious habit, idiopathic disease of the mucous membrane of the organs of generation is probably the most common form of what is called uterine disease, and the form which is most

likely to involve the derangement of the digestive and respiratory functions by sympathy. The sympathy so well understood to exist between the uterus and the stomach, is scarcely more intimate than that between the stomach and the lungs, and nothing is more common than to meet with evidences of such sympathies in the management of the diseases of these several organs. It is a complication to be closely studied, and it is an error, I apprehend, to suppose, that these diseases of the mucous tissues can in general be cured by local treatment alone. There can be no doubt of the usefulness of iodine and nitrate of silver as local applications to the throat, the bronchi, and the uterus, if not also to the coats of the whole intestinal canal; but that long-continued and chronic disease of these mucous tissues are to be cured by such limited means, ought not to be expected, and the hope is, in my opinion, not often realized. Probably the common dependence upon such local treatment has been encouraged by the practice of specialists, who, whatever may be the extent of their knowledge of pathology in general, are apt to confine their attention pretty much to the local affection they are accustomed to treat. The mucous tissues are too important a part of the animal economy, too closely associated among themselves and with other tissues, by nervous sympathy, and too influential in their functional relations, and over glandular and nervous action in general, and over the constitution of the blood, to be restored to health in all their parts by any remedies that can be applied to certain mucous surfaces. Sad mistakes are made in regard to this matter, prolonging the sufferings of patients, and leading in many cases to a fatal issue, either in true phthisis, or in symptomatic bronchial irritation closely resembling phthisis.

The bronchial secretion caused by symptomatic irritation is not to be confounded with that of pulmonary catarrh or with bronchorrhœa, which are either idiopathic affections, proceeding from some external cause, or the sequelæ of bronchitis, and are not necessarily dependent upon disorder of other mucous tissues. These preternatural discharges from the respiratory mucous membrane, caused by local excitement, may be acute and temporary, as in a common cold, or chronic and enduring, sometimes continuing even for a lifetime, and with scarcely more injury to the general health than the reduction of physical strength which results from excessive secretion. Nor is this symptomatic disease to be mistaken for that which is now so common and fatal, a sequela of imperfectly cured pneumonia. This simulates phthisis, perhaps, still more closely than the bronchial or membranous affection, but proceeds, mainly, from hyperæmia and hypertrophy of the parenchyma, resulting in ulceration and the formation of vomicæ, sometimes in atrophy. Since pneumonia has, more than formerly, come to be treated upon the expectant plan, and with much alcoholic stimulation, and especially when, in malarial districts, the periodic character of the disease is ignored in the treatment, this sequel would seem to have

become more common, and it is some confirmation of this view that mortuary reports show an increase in the proportion of cases of consumption.

It is all the more important to be able to discriminate between the idiopathic and symptomatic disease, because the treatment indicated in the two cases is in some respects different. The irritation existing in the mucous membrane of the throat and bronchial tubes, as well as in the parenchyma of the lungs, the effect of fever, of tuberculosis, or of stimulating vapours, finds remarkable relief in the proper employment of opiate remedies. The reason is, perhaps, that this irritation exists independently of any considerable derangement of the secretions connected with the process of digestion. I have generally found that whenever these are much impaired by febrile disease or other cause, opium is more or less injurious, because of its tendency to intensify the difficulty.

Now the cough mixtures in common use, and especially those which are sold so abundantly, and bought so anxiously by this class of patients, as secret nostrums, are nearly always dependent upon opium in some form for their beneficial effects. The sufferer from bronchial irritation generally finds sufficient encouragement in their continued and habitual use in the fact that they do allay to some extent the troublesome cough, and secure for the patient a considerable degree of comfort and repose. In many cases too there is, connected with indigestion, such persistent diarrhœa as encourages the use of these opiate mixtures to restrain it. Nothing appears more reasonable, therefore, as certainly nothing is more common, in these disorders of the mucous tissues, than that the patient, and sometimes the physician also, should attach importance to these cough mixtures as proper remedies for every kind of bronchial irritation. However suitable they may be to the disease existing in the respiratory organs, their inevitable effects are, to increase the morbid condition of the mucous membrane of the digestive system, and to restrain the healthy secretions of the liver and kidneys.

But the particular form of disease to which I wish to invite attention is, that continued symptomatic irritation of the pulmonary mucous membrane, causing first increased natural secretion and expectoration, and afterward more copious vitiated bronchial discharges, the effect of primary irritation of the mucous tissues of the organs of digestion and generation. Whenever this symptomatic disease becomes established in the lungs and throat, other abnormal affections soon appear in the glandular structures sympathizing with the mucous tissues. The skin becomes dry and husky, and sometimes desquamatorious; the urine scanty, high-coloured, often tinged with blood, and the bladder so irritable as to require that it be frequently discharged, and the stools afford evidence of a want of bile and of healthy intestinal secretions. There is dryness of the tongue, with a smooth and florid surface, often disfigured with fissures and patches, viscid saliva, perversion of the sense of taste, hardness, tenderness, and more or less tension

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of the abdomen, intestinal flatulence and obstinate constipation sometimes attended with diarrhœa. In females the uterine functions are first impaired and then suspended, with the frequent concomitants of constipation and hæmorrhoids.

In adopting a plan of treatment for this complicated and difficult disease, regard must be had to its history. The portion of mucous membrane first disordered is apt to be the most troublesome to manage, and it often happens that nothing more than a temporary alleviation can be secured while the original complaint remains unsubdued. In a large majority of cases of disease of the mucous tissues, the digestive organs are primarily affected, even when in its progress the most obstinate feature is the uterine or bronchial disorder. It sometimes begins in the stomach, constituting a form of dyspepsia, and sometimes in the large intestines, quickly affecting by sympathy the lining membrane of the uterus and vagina.

It is not my intention to describe all the different stages of the disease, or refer to all the remedial measures to be applied, which would extend this article to an inconvenient length; but there are anomalies in both the disease and in the action of remedies, which it is of importance to notice. The susceptibility of the bowels to the influence of cathartics, when the principal irritation is confined to the stomach and the small intestines, and the reverse condition when it originates in and is principally confined to the rectum and colon, is remarkable. In the former case, small doses of mercurial medicines are effective as both alteratives and cathartics, but in the latter, there is a specific virtue in aloes, which gives it great prominence as a remedy, and especially in view of its influence over the uterine disease so commonly existing as a symptomatic affection. Aloes may be used either in the solid or the liquid form, and in either case I have generally found the ancient compound of aloes and canella the best. It may be given in pills or in tincture, but in some cases, especially in those giving rise occasionally to copious watery stools, myrrh becomes a good adjuvant remedy. I suspect it to be a mistake to suppose that aloes frequently causes hæmorrhoidal affections. The rectal secretions become somewhat acrid under its influence, and, when long continued, it sometimes causes soreness, pain, and even swelling at the verge of the anus, but these soon disappear when the remedy is suspended. The affection is not hæmorrhoidal in its character, but, on the contrary, aloes is among our best remedies for this disease. The counter-irritation and relief of constipation produced by aloes, acting, as it does, mainly on the mucous membrane of the rectum, has an important remedial efficacy in the cure of both the uterine and the bronchial irritation, symptomatic of the intestinal disease.

Without pursuing this discussion to an inconvenient extent, I shall endeavour to subserve my original purpose by presenting, somewhat in detail, a remarkable case of what I have considered symptomatic bronchial irritation, cured by a very simple course of treatment, and illustrative of my

views in reference to this disease occurring as a consequence of indigestion from imprudent living.

On the 7th of October, 1855, I was requested to visit Colonel K., an old and experienced merchant of Memphis, Tenn., in consultation with three other physicians, all of whom had been in attendance on the case previously. The disease was called pulmonary consumption. The patient was emaciated, exceedingly feeble, with quick and weak pulse, laboured breathing, speaking only in almost inaudible whispers, loathing food, and expectorating largely. The matter expectorated was of a viscid, semi-purulent character, of a brownish colour, and intolerably offensive odour. Presuming that his physicians were correct in their unfavourable prognosis in this case, and not believing that I could render any valuable assistance, I begged to be excused from any agency in the treatment, and was about to withdraw, when I was informed that it was the earnest wish of the patient and his friends that I should take the sole charge of his case. To this I objected, as it seemed little short of folly for me to undertake the treatment of a dying man, who was already provided with a superabundance of able medical counsel. But the importunities of the patient and his friends were strong, and all the attending physicians concurring, I consented.

When left alone with my patient, I found his physical powers so exhausted, and his condition apparently so hopeless, that I hesitated whether I should attempt to do anything more than try to sustain and comfort him during the brief period that he seemed destined to survive. It appeared to me, indeed, that impending dissolution was so imminent as to preclude the propriety of active medication. But upon making such examination of his chest as he was able to bear, and learning the history of his disease, I had reason to suspect that it had been primarily a dyspeptic affection, and that the existing bronchial disease was symptomatic. I soon became convinced, too, that no part of the expectorated matter was the product of abscess in the lungs, as had been supposed. I administered half a grain of calomel and a drop of creasote, advised brandy and nourishment, most of the latter being by enemata, and left him for the night, half inclining to the belief that he would not survive until morning.

Early the next morning I found he had had a large, feculent, and very offensive stool, without increase of prostration, but he declared that he had passed the night without sleep. His loathing of food was somewhat less than it had been, his wife expressing surprise that he did not retch to vomit on her approaching his bedside with a cup of tea. I now gave him a quarter of a grain of calomel, with a drop of creasote, and advised the continuance of the brandy and nourishment as before. I arranged, also, for a moderate inhalation of the vapour of iodine every two or three hours. In the evening he appeared a little improved, having had two dejections from the bowels of the same kind as before, and succeeded in retaining a cup of chicken broth; but he expressed the opinion that my doses were too strong for him. Advising the continuance of the iodine inhalations, and repeating the creasote, I left him for the night without other remedies. His expectorations had been, hitherto, nearly a quart in twenty-four hours, the larger portion being at night. On this occasion he repeated his expressions of confidence in my treatment, and whispered in my ear, by way of encouragement, "I am a good deal better."

During the night his bowels acted three times, not largely, but he felt the prostrating effects, and said, "That little pill you gave me must have

been very strong medicine." His expectoration had been somewhat less copious, and the sputa were less offensive to the smell. I now repeated the calomel, a quarter of a grain, and gave one-fifteenth of a grain of strychnia. The latter was repeated three times during the day, and a drop of creasote was given with each dose. He used the iodine inhalations more freely, under the impression that they gave relief to his cough, and more nourishment was taken into his stomach, and retained. Still he had a disrelish for all kinds of food, was unable to raise his head from the pillow, and could speak only in whispers. At night he had had no further action of the bowels, and his expectorations were less copious. The calomel was repeated, and the strychnia, creasote, and iodine inhalations were continued.

He had two stools during the night, which, without being watery, were thin, of a yellowish colour, and much less offensive to the smell. His expectorations had been less copious and offensive, and he said he had enjoyed some refreshing sleep. For the first time, he now expressed a wish for food, but, after eating a little, he pushed the food away, and said, "I have no appetite after all." From this time onward the calomel was continued in doses of one-quarter of a grain, morning and night, strychnia, in doses of one-fifteenth of a grain, and one drop of creasote was given three times a day, together with iodine inhalations. His bowels were moved two or three times daily; his appetite improved, the expectoration steadily decreased and lost its offensive odour, and he gradually recovered his voice.

When he had continued this course for ten days, he declared that he was unable to restrain his appetite, and he gained strength rapidly, taking, for more than a month afterward, one-third of a grain of calomel every night, to the exclusion of other remedies excepting the iodine inhalations, which were continued. His cough disappeared entirely, and his health became better than it had been for many years previously. He died some years afterward, without any return of the pulmonary disease.

In this case the disease originated in the stomach and small intestines, and the mucous membrane of the colon and rectum did not appear to be disordered to much extent. It was a remarkable case of symptomatic bronchial irritation, baffling the diagnostic skill of able physicians. The remedial efficacy of small doses of calomel in restoring the impaired secretions is strongly exemplified in this treatment. While the treatment was designed for the relief of bronchial irritation, without reference to the original disease, the severity of which may, indeed, have been enhanced by the use of anodyne expectorants, there could be no hope of a permanent cure, which was effected by directing the remedial measures mainly to the relief of the digestive organs.

This patient had for many years been a free liver, gradually impairing the tone of his stomach and bowels, and disturbing the healthy functions of the nervous system, by imprudent eating and drinking and the use of tobacco. This it was, in my opinion, which caused the bronchial disease by sympathy, causing an inordinate amount of vitiated secretion, and extensive dilatation of the bronchial tubes.

Although the disease in this form is very formidable and exceedingly dangerous, the others to which I have referred appear to be more difficult

of management and cure. Scarcely can we expect, by any means now known, to control the disease when it has proceeded to such extremity as in the case related above, by sympathy with affections of the mucous linings of the large intestines and uterus. For some reason, of which I am ignorant, the derangements of the nervous system in these cases are more serious and persistent, while the remedies employed in the gastro-enteric disease fail to afford the same relief. There is, in general, as I have intimated, obstinate constipation to contend with, and there is also an engorgement or hyperæmia of the lining membrane of the uterine cavity and cervix, rendered more obstinate and persistent in most cases by displacement, and especially by prolapsus; but even when these evils have been to a considerable extent subdued, the bronchial disease is very apt to continue, causing large expectoration of frothy mucus, accompanied by frequent and feeble pulse, pain in the thorax, red and sometimes swollen tongue, and rapid loss of flesh and strength. Aloes, calomel, creasote, turpentine, strychnia, and various narcotic remedies, to allay nervous irritation, may produce beneficial effects, and sometimes give permanent relief, but in too many cases the disease goes on, and results in death for the want of means of cure which have not yet been discovered.

ART. VI.—*On Puerperal Tetanus.* By WM. A. GORDON, M. D. Read before the Bristol South District Medical Society at New Bedford, Mass.

THREE cases of puerperal tetanus have occurred in my practice during the last five years, and they are the only instances I have had the misfortune to meet with during my professional life of now thirty-five years.

The first case occurred in a healthy, temperate Irishwoman, the mother of four children. I was called to her on Sunday afternoon, August 7th, 1859. I learned that she had aborted on Wednesday at an early period of pregnancy, eleven days previous to my visit. The abortion was not attended with very much pain or flooding, and the woman kept her bed only till the afternoon of the next day, Thursday. Since that day she had attended to the duties of the household. Upon the Monday following she went a short distance to market, bringing home a heavy basket of provisions without unusual inconvenience. On Wednesday evening, a week after her abortion, she sat a considerable time at the outside door upon the door-sill, her feet resting upon the stone doorstep. On the following day, Thursday, she made complaint of pain in the head, which extended to the jaws and throat. She took a dose of castor oil which operated on Friday, and from that time till Sunday she was using various remedies prescribed by the old women and midwives. At the time of my visit (Sunday) she complained of a painful stiffness of the jaws, which came on first, and had extended to the muscles of the back, between the scapulæ, and to the throat.

She could not open the mouth to protrude the tongue, and swallowing was difficult. Her intellect was unaffected; pulse natural; skin warm and perspiring. The lochial discharge had quite ceased. There was no pain of the back, or any symptom of metritis.

On Monday the muscles of the back of the neck became stiff and contracted, while those of the back were slightly relaxed. During the following days the tetanic spasms, which the patient called "cramps," increased, producing opisthotonos, and extending to the larger muscles of the limbs. Her condition at this time was very distressed, the spasms being severe, sudden, and extensive. She suffered much from the accumulation of phlegm in the throat which threatened suffocation, and was with great difficulty expectorated. She got very little sleep; complained much of general distress occurring in exacerbations. Her pulse became quicker and small, and her death occurred on Thursday afternoon. I was at this time not quite certain as to the nature of the case, it being the first one of this rare disease which I had seen.

The treatment consisted of purgatives of senna and salts, the application of large mustard poultices and hot fomentations to the scapular regions, with opium and calomel at bedtime, with an increase of the quantity of opium and of the doses as the spasms became more severe. These were discontinued, as she failed to swallow them, on Wednesday afternoon, and etherization resorted to. But she declared that it increased her distress, and refused to use it after I left.

The second case occurred in May, 1863. This patient was a mother of five children, a farmer's wife of excellent health and habits, aged about 40, I think. I was called to her on the evening of the 25th. She complained of pain low in the back, extending through to the abdomen, constant, at times aggravated. The abdomen was enlarged and tender, and she had considerable fever, also some hemorrhage from the uterus, though not severe. To my question whether she was pregnant, she replied that she did not know, but if she were, she should prefer to abort, and desired me to do nothing which should prevent it.

My treatment was directed to the removal of the symptoms of metritis, as I considered; and it was continued till the 28th, when I took leave of her. She was then free from pain and fever, and had only moderate hemorrhage; but abortion had not to my knowledge occurred.

About thirty-six hours after this last visit, on the evening of the 29th, I received another summons, and then found my patient complaining of stiffness of the jaws, neck, and throat. This soon extended to the muscles of the back, and all became affected by severe and painful tonic contractions. The trismus was especially distressing to her. Deglutition became increasingly difficult. The attempt to swallow was followed by severe spasms. Her death took place on the 30th.

The treatment was at first chloroform inhalation. But the patient, although apparently relieved, immediately upon regaining consciousness, expressed herself as feeling worse, and after a few trials it was laid aside. Large doses of Dover's powder and calomel were then exhibited, and strong turpentine enemas, with castor oil. During the last night of her life she was directed enemas of tobacco at intervals of six or eight hours; but only one was administered. Her death occurred on the morning of the 30th, less than 48 hours from the commencement of the tetanic symptoms. The

patient had not been exposed to cold in any manner; indeed, she had not left her bed since my first visit.

I learned after her death that she had undoubtedly been subjected to an operation for the procurement of abortion a few days previous to my first visit.

The third case occurred in July, 1863. My attendance commenced on the 24th of June. The patient was a woman of good health and habits, a mother of three children, aged about thirty-five. I found her flowing very freely, a condition which had existed for some hours. She was faint, but had slight pain. Cold applications were made, ergot and finally opium and acetate of lead and the tampon of sponge. The abortive process was completed, and I discontinued my attendance on the 29th. The woman I found on that day sitting upon the sofa, and I took my leave with many cautions as to exposure and exertion. Indeed, my advice was that she should remain in bed a fortnight.

Five days after, on the 4th of July, I was again called to this patient. She was in bed complaining of stiffness of the jaws and throat. Tetanic spasms soon followed, opisthotonos, with severe spasms of the limbs at times more severe than at others.

The spasms seemed to be controlled in some measure by the use of belladonna and lobelia in doses short of vomiting. Upon these remedies principal dependence was placed. Beef-tea and wine were exhibited as nourishment. The case resulted fatally on the 12th of July, eight days after the attack began.

Of these cases we may observe, first, that they occurred after abortion, in the early period of pregnancy, and all of them proved fatal. Second, although the first case might be supposed to have been owing to exposure to cold, the reputed cause of "idiopathic tetanus" in general, the second case could not have been so caused, as the patient had not left her bed after treatment for the metritis, to the time of the tetanic attack. Third, with regard to the retention of the secundines. In the first and third cases these had been discharged, while in the second they were retained. Fourth, the abortion was not produced in the first case, while in the second it is probable that it was procured by instrumental means, and in the third case stimulating teas had been freely drank with the design of producing the abortion. Fifth, the disease occurred at very various periods after the phenomena of abortion came on, viz., in the first case in eight days, in the second in four days, and in the third ten days afterwards.

The following points of interest in regard to this disease seem to me, I will not say established, but rendered probable by these cases: That it is more likely to occur after abortion than after confinement at the full term; that it occurs whether the abortion may have been procured or not, and whether or not the secundines be retained; that it may occur and is most likely to occur within ten days of the commencement of the abortive effort. And, finally, that it is very dangerous, and generally fatal.

Upon an examination of those medical periodicals which my own library contains, I find but a single report of a case in this country in the *Ameri-*

can Journal of Medical Sciences, since 1827 to 1860. That case was reported by Dr. Storer, of Boston. It occurred after a confinement at the seventh month, September 20, 1841. The placenta, being adherent by its whole surface, was not discharged. Only three small portions of the size of English walnuts came away on the 26th of September. Tetanic spasms came on September 27th, seven days after the birth of the child, and occasioned death at midnight of the 28th. There were no symptoms of metroperitonitis, or any unusual symptoms or trouble until the 26th, when the doctor made an attempt to remove the placenta, and administered ergot with only partial success. The doctor seems to attribute the casualty to the retention of the placenta.

The same journal contains a notice of two cases reported to the Obstetrical Society of Edinburgh, in 1850. Both of these cases occurred after abortion; one seven days after the abortive effort commenced, in which death occurred on the third day. The second supervened upon an attack of tonsillitis. Stiffness of the jaws being complained of on the first day, which increased and was followed on the fourth day by tetanic spasms, which occasioned death in the afternoon of the same day. In this case the tonsillitis occurred in consequence of exposure, as was supposed, to cold, upwards of a fortnight after the abortion; and this was at an early period of pregnancy.

At this meeting, Dr. Simpson, of Edinburgh, observed that he had seen a woman die of tetanus after a uterine lesion. "In this case a very large, soft polypus was detached and thrown off by the spontaneous efforts of the uterus. A few days subsequently the patient had difficulty in opening her mouth. She died in course of fifty hours with all the symptoms of general tetanus." The same journal records that "in some of the Registrar-General's Reports two cases of death from tetanus after childbirth are noticed."

The *Medico-Chirurgical Review* notices, in the July number of 1849, the report by Dr. Aubinais, of Nantes, of three cases, two of which occurred after confinement at the full time, and one at seven months. One case resulted *in death* seven days after the tetanic condition came on. "The tetanus in this case seemed to have been induced by exposure to cold; the patient, with high milk fever, got out of bed and walked across a wet floor with bare feet. She was soon seized with shivering, difficult deglutition, and gradually the tetanic condition markedly prevailed."

In the second case, the patient had been bled during an attack of eclampsia. Delivery followed soon after at the seventh month; and on the fifth day, having drank largely of cold water, she was seized with shivering, trismus, and finally complete tetanus. This patient recovered under the use of blisters alone, and warm fomentations to restore the lochia. The spasmodic symptoms did not give way for twenty days.

In the third case, the patient, four days after confinement, while in a

state of perspiration, exposed herself to wet and cold, suppressing the lochia. The tetanic symptoms occurred twenty-four hours after; became fully developed, and continued, obstinately resisting the most active antiphlogistic treatment, until the tenth day, when they began to give way, and she recovered. She was bled six times, had one hundred leeches applied, and afterwards took musk and valerian.

These nine cases are all which these journals, the *American Journal of the Medical Sciences*, the *Medico-Chirurgical Review*, and *London Lancet*, have reported during the last thirty years. Of these only two occurred after confinement at the full time. The attack occurred within ten days, except in one instance in which a fortnight had elapsed. The disease proved fatal in all except two cases, and one of these, that which followed the eclampsia, might have been more of a simply nervous character. It continued twenty days, and is said to have yielded to blisters and warm baths. The other recovery was after excessive depletion, six venesections, and one hundred leeches.

These results hardly serve to vary the conclusions drawn from my own cases, while they serve to strengthen the point, *that no woman is safe from the attack for at least ten days after the uterine effort, whether in cases of abortion or of child-birth at the full time.*

ART. VII.—*Contributions to Aural Surgery. The Use of the Artificial Membrana Tympani.* By D. B. ST. JOHN ROOSA, M. D., Aural Surgeon to the New York Eye and Ear Infirmary. Lecturer in the University of the city of New York.

CASE I. A farmer, æt. 30, from Michigan (at the Infirmary), January 1865. The patient had scarlet fever thirteen years ago, since which time he has suffered from periodical attacks of pain referred to the ears, discharge of pus from them and vertigo. He has also been so deaf as not to hear ordinary conversation ever since the attack of scarlatina. Patient's general condition is bad, he having suffered much from intermittent fever. Cannot hear a watch, which should be heard by a person with normal hearing power, more than four feet, at all, neither on auricle, mastoid process, nor frontal bone. The right membrana tympani has been wholly removed by ulceration, no trace of *ossicula auditus*. Mucous membrane of the cavity of the tympanum hypertrophied. A portion of the periphery is all that remains of the left membrana tympani. The incus and stapes remain in situ, but the malleus has been lost. Mucous membrane of cavity of the tympanum also hypertrophied. Both Eustachian tubes are pervious, as proven by the Valsalvian experiment. The artificial membrana tympani was placed in the right ear without producing the slightest benefit; being inserted in the left, it immediately so improved the hearing, that the watch could be heard two inches from the auricle, and ordinary conversation several feet. The patient was enabled to pronounce isolated words after

a speaker standing more than twelve feet distant. The patient was under observation for a few days, during which time the hearing remained as good as above stated. He then left for his home, taking with him a supply of the artificial membranes.

CASE II. Miss U., æt. 30, N. Y., May 31, 1863. Patient has been deaf ever since she can remember. Does not hear conversation unless specially addressed, and then the voice must be raised. She knows no cause for the deafness. Hears the watch two inches from the right auricle, not at all on the left side, except upon the mastoid process. Left membrana tympani opaque in its mucous and fibrous layers. The light spot is lessened in size, and the head of the malleus is abnormally prominent. Right membrana tympani perforated by ulceration in centre, the remaining portion is granulated. A very slight amount of greenish fetid pus is secreted by the cavity of the tympanum and the remains of the drum. The pharynx is congested. Eustachian tubes impervious, as shown by the Valsalvian experiments, Politzer's method, and the catheter. General health not good, although no especial disease is recognized. Patient was seen every few days until August 5th, during which time the following treatment was carried on: Permeability of the Eustachian tubes was secured by the use of the catheter and Politzer's method, together with the use of gargles, and a weak solution of sulphate of zinc (gr. j ad aq. ℥j) was applied to the drum, after daily syringing, in order to check the ulcerative process. When this was restrained, an artificial membrana tympani was applied and worn except at night. It caused at first much irritation and furuncular inflammation. The artificial drum was removed until this was checked. The drum is now worn all day, and the watch is heard from six to eight inches with it, only two without it. Ordinary conversation heard fairly; hearing on the other side as before. Patient expresses herself as being very much improved.

CASE III. J. J. V. P., æt. 28, La., Aug. 12, 1865. Three years ago while in the artillery service patient lost his hearing gradually, although he remembers at one particular time after being engaged in heavy firing, that he had a distinct sensation of ringing and fulness in his ears. When a child he had the same sensation in the right ear, after which he was deaf from that ear for some time. The ears were treated by the medical officer of the regiment by the application of tannic acid. He continued in the service until the end of the war, and was subjected to various kinds of treatment, application of arg. nit., cup. sulph. and other astringents. At times he could hear quite well, and then his ears were "stopped up" for a time. He was exposed to much hardship during a great part of his term of service. The deafness has increased until now, when he cannot hear at all from the right ear, and from the left with the aid of an ear trumpet. He does not hear the watch at all on either side. The right membrana tympani, except as to the upper portion, where a small rim remains, has been removed by ulceration. The integument of the auditory canal, and the mucous membrane of the cavity of the tympanum, are hyperæmic and swollen. The little bones of hearing cannot be found. There is a slight amount of fetid pus secreted by the mucous membrane. On the left side the auditory canal is extremely hyperæmic, swollen, and tender. The epidermis is exfoliating. The membrana tympani is not seen, but the Valsalvian experiment shows that it is perforated. Both Eustachian tubes are open.

October 18. Since the first date the patient has been seen twice a week, and has been treated in the following manner. The ears have been gently

syringed with warm water twice a day, a weak solution of the sulphate of zinc (gr. ss ad ℥j) has been dropped into the auditory canal and cavity of the tympanum, always warming it before use, and injections of the vapour of iodine have been made into the middle ear, by means of the combination of Politzer's method for rendering pervious the Eustachian tube with an inhaler, described by Dr. Buttles, of this city.[1] (This method of combination is, I believe, original with myself. Buttles' inhaler consists essentially of a hollow bulb of hard rubber with a nozzle. In the cavity of the bulb is placed a small sponge, which is saturated with the tincture of iodine. This bulb is attached to a bit of rubber tubing, and this is in turn placed over the pipe of an ordinary soft rubber globular syringe (Politzer). The nozzle of the inhaler is inserted in one nostril, the other being closed with the finger, the mouth is also shut, and the patient told to swallow (a little water facilitates this); just as the patient is in the act of swallowing, the physician compresses the bulb of the syringe, the Eustachian tubes open, and the air, iodized, passes into the cavity of the tympanum, or, barring a mooted point, into the faucial orifice of the Eustachian tube.)

The condition of the patient's ears is now as follows: On the right side the hyperæmia and swelling are reduced to a minimum, as also on the left. In the left cavity of the tympanum the incus in position can now be distinctly defined. On this side the artificial drum is worn by day, except when the patient is alone for some hours, and removed at night. On the right side the drum has been worn at times, but never with any appreciable change as to the hearing power, which remains as when patient first came under observation, except that he can now hear the alphabet pronounced through an elastic tube.

On the left side he can hear the watch over the auricle, and ordinary conversation near at hand with ease. He can hear a sermon in church, and goes once more into society, from which his previous amount of deafness completely shut him out. He does not now use an ear-trumpet at all, hearing better without the drum than he did formerly with the aid of a conductor of sounds. The patient is extremely intelligent, and to his strict attention to the directions given—his careful use of the artificial drum, removing it whenever it has caused the slightest irritation—a great part of the modicum of success attained is due.

CASE IV. Miss N., æt. 18, July 18, 1865. One year ago was quite ill, the nature of the affection cannot now be accurately ascertained. During the sickness both ears began to discharge pus, and deafness appeared. The discharge was checked, but the deafness has gradually increased until now, when she cannot hear ordinary conversation, and hears the watch only one inch from the auricle. Each membrana tympani has a central perforation, and there is a slight amount of yellow fetid pus secreted in the cavity of the tympanum. The Eustachian tubes are pervious. The artificial drum improves the hearing on each side, by the watch, to a distance of six inches, and renders ordinary conversation easily heard. The patient was directed to daily syringe the ears with tepid water, using afterwards an astringent, and to wear the drum during the day. Patient has come to the office very irregularly, and carried out the directions very inefficiently. She seems to have an aversion to the use of the drums, wishes to be cured without wearing them. They cause very considerable irritation of the auditory canal.

[1] New York Medical Journal, July, 1865.

CASE V. Rachael C., æt. 16, April 1, 1865 (at the Infirmary). One year and a half a ago, patient discovered that she did not hear well. The deafness still continues with some occasional pain and noise in the ears. She can hear the watch three inches from the right ear, one inch from the left. There is a perforation of each drum with a slight ulcerative process going on in the membrane. Patient is of a strumous diathesis, has a curvature of the spine, but is just now in fair general health. Careful syringing of the ears, followed by the use of an astringent, was directed. There is no account of the condition of the Eustachian tubes until *June* 8, when Dr. C. E. Hackley, inserted an artificial membrana tympani and made the following note: "Artificial drum tried on the right side, of which the Eustachian tube is pervious, the hearing distance increased to ten inches. Politzer's method of rendering pervious the tube was practised.

June 22. "Left Eustachian tube is now pervious, with artificial drum, hearing advanced to twelve inches."

Sept. 14. I saw the patient and made the following note: "Patient has been in the country and has worn the artificial drum by day ever since. Hearing distance, right ear twenty inches, left two feet. Drums cause no irritation whatever.

Remarks. Surgical literature, so far as I can find, has comparatively little reference to cases in which the artificial drum has been worn. I have, therefore, given the foregoing somewhat in detail, in order to show about what may be accomplished by the substitute for the natural membrane. The cases have been taken without any particular choice, from a number of which I have notes. It is the habit of the writer to tentatively apply the artificial membrane to all ancient perforations, where the hyperæmia and inflammation or discharge of pus are not very considerable. Recent cases of perforation, as a rule, heal so readily that the use of the drum is not indicated.

In order to a successful use of the artificial membrane—

1. The Eustachian tube must be pervious.

2. The stapes or incus of the ossicula must be *in situ.*

3. The inflammatory action in the external auditory canal and remains of the drum must not be excessive.

It is also of great assistance to the surgeon in procuring a successful wearing of it, that the patient should be intelligent enough to realize that at the best the disk of rubber is a foreign body, which should be carefully removed at any approach of irritation. It is, therefore, not of much use in the case of children, or unusually stupid or careless adults. It should also be stated that cases have been found where all the above-named conditions have been fulfilled, where it was *à priori* supposed that the artificial membrane would do good, and yet repeated trials proved that the use of it effected nothing for the hearing.

In these cases we may perhaps conclude that there existed very considerable rigidity of the quasi articulation of the stapes with the *fenestra ovalis.*

ART. VIII.—*Successful Removal of the Uterus and both Ovaries by Abdominal Section; the Tumour, fibro-cystic, weighing thirty-seven pounds.*[1] By HORATIO ROBINSON STORER, M. D., of Boston, Assistant in Obstetrics and Medical Jurisprudence in Harvard University, Surgeon to the New England Hospital for Women, and Professor of Obstetrics and the Diseases of Women in Berkshire Medical College.

BUT few of the capital operations of surgery have been attended by so uniformly a fatal result as has been extirpation of the uterus when in its normal position; seven-eighths of the attempts at removal of the organ under these circumstances, prior to 1863, having resulted in death. The voice of the profession, therefore, even of that branch of it more particularly devoted to the treatment of the diseases of women, and accordingly more likely to be sanguine of success, has been almost unanimous in pronouncing the operation unjustifiable. Such has been the verdict in the past, and such is found to be the case even in the present days of legitimatized and frequent abdominal section for ovarian disease. Thus, says Gendrin—

"It is evident that the extirpation of the uterus is one of the gravest of operations in surgery, since it is the most fatal. We must conclude that in many cases it will be wiser to abstain from the operation."[2]

"We consider extirpation of the uterus, not previously protruded or inverted," wrote the editor of a leading British periodical, "one of the most cruel and unfeasible operations that ever was projected or executed by the head or hand of man. We are very far from discouraging bold or untried operations, but there is a limit beyond which it may not be prudent to go, even should a solitary instance or two of success rise up as precedents to bear out the operator."[3]

"After a careful examination of the results of the operation when the uterus is *in situ*," remarks Churchill, thirty years later, "it is really difficult to find adequate reasons in its favour, except the repugnance which every one must feel to give up entirely the hope of affording relief."[4]

Prof. Simpson, so late as within three years, has used the following language:—

"Cases have been put upon record where the operation was performed, but with such disastrous results as to hold out no encouragement whatever to its repetition, but rather to serve as a loud warning against it. Judging of it

[1] An abstract of this paper was communicated to the American Academy of Arts and Sciences, at their meeting of Nov. 14, 1865, in the hope that certain points involved, as the attempt at menstruation in the absence of both uterus and ovaries, might thus be more completely brought to the attention of physiologists and other scientists in medicine, just as its present publication will reach the great body of workers in practice.

[2] Journal Générale de Médecine, Oct. 1829.

[3] London Medico-Chirurgical Review, July, 1825, p. 264.

[4] Diseases of Women, p. 318.

a priori, we should regard the operation as unjustifiable, and experience serves only to confirm the judgment. * * * Even when the disease is confined to the body or fundus, extirpation of the uterus is such a hazardous operation, that I have no hesitation in saying that it should even then be rejected, as an utterly unjustifiable operation in surgery."[1]

The quotations above given are expressions of opinion as to the justifiability of the operation in cases of malignant disease, where, in the presence of intense suffering, and the life of the patient being necessarily in immediate peril in the absence of any such attempt, there is the greatest excuse for its performance.

For the treatment of cancer, methods have frequently been considered legitimate that would be condemned for any other form of disease. Desperate cases have, through their very desperation, nerved both surgeon and patient to measures from which, for other diseases, each would equally have shrunk. If, then, the extirpation of a carcinomatous womb by abdominal section is pronounced unjustifiable by our leading authorities, on the mere ground of its immediate dangers, irrespective of the probably recurrent character of the disease, it is not surprising that the removal of the organ for non-malignant affections should have been, at least as decidedly, considered improper, and we therefore find Graily Hewitt, of London, the last and the best of British systematic writers upon the diseases of women, speaking as follows:—

"The inconveniences resulting from the presence of tumours of the kind now under consideration (fibrous) are hardly ever sufficiently intense to render justifiable their removal by surgical operation."

And again:—

"Ordinarily, the effects of the presence of large fibroid tumours of the uterus in the abdomen are not such as to call for or to justify operative measures. In some such cases the abdomen has been opened for their removal, under the impression that the tumour was of ovarian nature, and in some such cases the tumour has been excised, but generally with unfavourable results. Such cases are not fitted for operation."[2]

He speaks of the sole British instance of success, that by Dr. Clay, of Manchester, "whose boldness and success in abdominal operative surgery are unequalled," as "a most remarkable case, an exceptional one in every sense of the word;" and the leading medical journal of London, also in 1863, characterizes the other successful instance of the operation in Europe, that by Koeberlé, as "one of the most extraordinary operations ever undertaken in surgery."[3]

Most of our latest obstetrical authorities omit all mention of the possibility of the removal of the uterus when *in situ*, by their silence expressing the strongest condemnation of its mere idea; while others confine their remarks to those methods of partial procedure, by enuclea-

[1] Clinical Lectures on Diseases of Women, 1863, p. 65.

[2] The Diagnosis and Treatment of Diseases of Women, 1863, p. 572.

[3] Med. Times and Gazette, 1863, p. 604.

tion, &c. &c., which, in my own hands as in those of others, have proved successful where the uterus could be approached from below, but almost every instance of attempting which by supra-pubic operation has proved fatal.

Thus, Dr. West, of London, speaks as follows:—

"The non-pediculated growths, and those pedunculated tumours which spring from the outer surface of the uterus, are almost or altogether beyond our reach. A few cases are on record in which the abdomen has been laid open, and in which the extirpation of a fibrous tumour from the outer surface of the uterus has been attempted, and even actually accomplished. In all instances but one, which is reported by an American surgeon, Dr. Atlee, its completion was followed by the patient's death. It is a proceeding to be altogether deprecated, difficult to accomplish, almost certainly fatal if concluded, surrounded by dangers which wisdom cannot foresee, nor skill avert."[1]

The above remarks are but an echo of the opinion of Dr. Rigby, expressed the year before, who said that—

"The position, form, size, and connections of the tumour must be peculiarly favourable to render such an operation possible, and even then it would only be justifiable if accompanied with symptoms of the most urgent character."[2]

While the very last writer of all upon the subject, my friend Prof. Byford, of Chicago, thus summarily disposes of the whole subject:—

"There remain a large number of uterine tumours that are wholly beyond the reach of the surgeon. I am not aware that any living surgeon advises the removal by surgery of an extra-uterine fibrous tumour, even when we can decide that the pedicle or point of attachment is small."[3]

Under these circumstances it might seem presumptuous for me to claim, as I shall now do, for extirpation of the uterus affected simply with non-malignant disease, its place as a practicable and perfectly legitimate operation in surgery, were I not able to furnish positive evidence of a character to outweigh all merely preconceived opinion, as well as that based upon the result of previous operations, part of which were unfavourable only because they had been more or less carelessly or improperly undertaken or performed.

Quite a number of attempts at extirpation by abdominal section of the uterus enlarged by fibrous outgrowths have of late years been made, some of them successful so far as concerns removal of the tumour, some of them uncompleted, but a large majority of them rapidly proving fatal. It is necessary that this operation should not be confounded with removal of the undisplaced organ by the vagina; nor with its removal when prolapsed; nor with removal of an inverted uterus; nor with amputation of the cervix below the vaginal reflexion; nor with amputation of the cervix above the vaginal reflexion; nor with removal of sessile or pediculated fibroid projections into the uterine cavity; nor with attempts at enuclea-

[1] Lectures on the Diseases of Women, Lond. 1858, p. 308.

[2] Constitutional Treatment of Female Diseases, Lond. 1857, p. 196.

[3] Practice of Medicine and Surgery applied to the Diseases and Accidents incident to Women, 1865, p. 365.

tion, by approach from below, of interstitial uterine tumours; nor with attempts at removal, by approach from below, of extra-mural pediculated or non-pediculated uterine growths; which are all of them very different procedures, and have all of them, with the exception of the first, been attended with a much lower degree of mortality. It should not be confounded, moreover, with three other operations which it might seem to more closely resemble, namely: with the removal, by gastrotomy, of pediculated uterine fibroids; nor with the attempt at enucleation, after gastrotomy, of interstitial uterine growths, allowing the matrix to remain *in situ*;[1] nor with removal of the organ through an abdominal incision, after its attachments had been divided by dissection from the vagina; each of which operations is probably intrinsically more fatal, the latter, indeed, almost necessarily so. Nor should the operation by simple abdominal section be thought so very different from the ordinary operation for extirpation of an ovary, save as concerns the greater difficulty of its performance, the greater courage it requires in the surgeon, and the greater necessity of careful preparatory and after-treatment.

The removal of the uterus by abdominal section, for malignant disease, was proposed by Wrisberg in 1787,[2] and again by Gutberlat in 1814;[3] neither of them, however, seeming to have attempted it in practice. It is said, indeed, to have been performed by Blundell and by other foreign surgeons; but, upon investigation, I find that, with the exception of a single case by the elder Langenbeck, which died soon after the operation,[4] the dissections were made from below; in one or two instances, it is true, there having been also an abdominal section conjoined, through which to steady the organ during the operation, and to remove it, when excised from the vagina. These cases, unless perhaps one of Blundell's, seem to have been uniformly fatal. There are still others, that I find were merely the ordinary ones of inversion or prolapsus, operated upon in the usual manner. One or other of these statements will be found to apply to the famous cases of Sauter, Hunter of Dumbarton, Holscher, Osiander, Delpech, Recamier, Heath, Windsor,[5] Banner, Roux, Lizars, Bramer, Siebold, Dubled, Luytgaerens, Rust, and others. There is still another class of

[1] In describing a late case of the kind referred to, Spencer Wells states that he reports it only as "a warning" against the repetition of the operation.

[2] Malgaigne: Operative Surgery.

[3] Siebold's Journal für Geburtshülfe, Nov. 1825, vol. v.

[4] Edinburgh Med. and Surg. Journal, Jan. 1826, p. 242.

[5] Windsor's case is spoken of in the *Boston Medical and Surgical Journal* for July, 1855, p. 445, as one of successful extirpation of the uterus through the abdominal walls; upon examining, however, the tenth volume of the *Transactions of the Medico-Chirurgical Society of London*, in which it was reported, the case proves to have been merely one of inversion removed by ligature from the vagina.

cases, like that of Granville,[1] reported by Lyman[2] as one of fibrous tumour of the uterus, but which, upon examining the authorities referred to by him, I find to have been distinctly ovarian.

The operations for removal of the uterus by purely abdominal section, for non-malignant disease, have all occurred within comparatively a very recent period. The chances have been considered so great against success, that Dr. Atlee, of Philadelphia, known abroad as the American ovariotomist *par excellence*, and at home as our boldest and most successful operator upon uterine tumours, writes me that he has never attempted extirpation of the uterus, although his "abdominal sections have now numbered 125;" and Professor Meigs, of Philadelphia, whose European reputation as an obstetrician has for many years been greater than that any other American has ever attained, writes me as follows: "I consider you to have been very fortunate to have been able to discharge your patient cured, after so dreadful an operation. Certainly it is one that I could never have been induced to perform."

So far as I can ascertain from careful inquiry, and I have now received many letters upon the subject from leading authorities at home and abroad, there have hitherto been put upon record but five successful cases of extirpation of the uterus by purely abdominal section; one of them British, by Clay of Manchester,[3] one of them French, by Koeberlé of Strasburg,[4] and three American, one of which was by Kimball of Lowell,[5] and the other two by Burnham of the same city,[6] the majority of successful cases thus belonging to American surgery. They were all five, non-malignant tumours.[7] To these cases I now add a sixth from my own practice.

Sarah A. Colcord, of Malden, placed herself under my charge on 25th August, 1865. She is aged 47, unmarried, and has enjoyed good health until, some five years since, she became conscious of the existence of an abdominal tumor. This has steadily enlarged, and in May last she con-

[1] London Med. Gazette, xxxi., 1843; New Monthly Magazine, Oct. 1827; Lee on Ovarian and Uterine Diseases, p. 86.

[2] History and Statistics of Ovariotomy, 1856, p. 66. The cases quoted by this author from the seventeenth century, by Andreas à Cruce, Carpus, and Zacutus Lusitanus, I find to have been instances of removal of ovaries, or else of the uterus by the vagina, and not by abdominal section.

[3] Transactions of the Obstetrical Society of London, vol. v. 1864, p. 67.

[4] Medical Times and Gazette, February, 1865, p. 209.

[5] Boston Medical and Surgical Journal, May, 1855, p. 249.

[6] Nelson's Northern Lancet, January, 1854; Worcester Journal of Medicine, February, 1854, p. 40; Boston Medical and Surgical Journal, October, 1865, p. 211.

[7] It was Clay's case that persuaded Dr. Simpson to modify the opinion I have quoted from his Clinical Lectures. In January, 1863, he allows that "the case may turn out as a precedent for operative interference in some exceptional cases of large fibroids of the uterus." Transactions of the Obstetrical Society of London, vol. v. 1864, p. 70.

sulted Dr. J. L. Sullivan, of Malden, who diagnosticated the tumor to be uterine and advised against any operation.[1] Miss C. is now larger than a woman at the full term with twins, walks with difficulty, cannot lie down without dyspnœa, is emaciated, very anxious about herself, and desires relief. She is quite deaf. The menses have continued normal up to the present time though always somewhat scanty, and were present a few days since. There has been little or no dysmenorrhœa, certainly nothing like uterine contractions or expulsive pains.

Upon examination, the vagina was found occluded by an extensive hymen and very sensitive, on which account, as well as for greater accuracy in diagnosis, the patient was thoroughly anæsthetized. By external palpation, the whole abdomen was discovered to be filled by a resisting mass, in outline apparently single or mono-cystic, although affording localized fluctuation at many points of its surface, the waves being equable, but neither sharp nor dull—neither distinct nor obscure—evident enough to afford no doubt of the existence of fluid, but yet by no means strikingly decided. The outline of this abdominal tumour was regular and uniform, save in the right iliac region; laterally and inferiorly there was felt a double prominence, more marked upon deep pressure, the two portions distinct from each other, slightly movable, and each giving much the sensation of a small fœtal head. These points were not so marked except under anæsthesia. There was no vascular bruit upon auscultation, nor any sign of ascitic effusion.

By the vagina the cervix was found somewhat hypertrophied, and, so far as could be judged, for the vagina was very narrow and contracted, though not very unusually elongated, the same was true, and to a greater degree, of the body of the uterus. The cervix, as above implied, was somewhat elevated, and external to it there was general resistance, non-fluctuating to pressure upon both walls of the vagina, but nothing decisive as to whether the tumour was uterine or ovarian, nor could additional evidence upon this point be afforded by examination by the rectum. The os was nearly normal in size; the sound entered, not without difficulty, a little more than the normal length, two and a half inches, and the impression was given, after prolonged, careful manipulation, that this only was the extent of the uterine cavity; the negative character of this evidence being explained by the cavity having been encroached upon by the thickening of its walls. The uterus could hardly be moved by the sound, either with or independently of the abdominal mass, which was itself almost immovable. The diagnosis was therefore left undecided—there being present some signs of a multilocular ovarian cyst with an enlarged, but indurated base—while on the other hand the condition of the right iliac region, as examined from the abdomen, was unlike anything I had

[1] Dr. Sullivan writes me as follows: "I expressed to her my conviction that the uterus was the organ primarily affected. I confess that I was then ignorant of the fact that excision of the uterus had been numbered among the triumphs of obstetrical surgery. While a medical student, I had twice witnessed the abdomen laid open from sternum to pubes, and an immense uterine outgrowth removed by separating it from the womb, and ligaturing the bleeding vessels; both patients died within twenty-four hours, from internal hemorrhage. Bearing in mind these cases, and feeling certain in this instance that the uterus was involved in the mischief, I did not regard the case as one suitable for operation, and expressed myself accordingly."

previously perceived in confirmed ovarian cases. In addition to this, was to be taken into consideration the unusual circumstance, supposing the case to be fibrous and uterine, of the evident, but localized fluctuations detected throughout the greater part of the abdominal mass, and the absence of both menorrhagia and non-periodical hemorrhage.

It was clear enough from the examination, the history, and the presence and character of the catamenia, that the tumour was neither an uterus distended by pregnancy, natural or abnormal—whether from hydatiginous degeneration of the chorion, amniotic dropsy, retained placenta or membranes, or a mummified fœtus, nor was it an instance of hæmatometra, whether endo-uterine effusion, or peri-uterine, or pelvic hæmatocele, hydrometra, or physometra.

It was not a case of excessive pelvic cellulitis; nor of abdominal tumour more properly speaking, commencing from a strictly abdominal origin and extending downwards into the pelvis.

There was present no sign of large intra-uterine polypus, pediculated, sessile, or enucleating, nor any of malignant disease, either of ovary or uterus—whether of cervix, body, or fundus.

Under these circumstances, perceiving that the case was an unusual one, I admitted the lady to my private hospital in Boylston Place. Upon the next day I sought the opinion of my father in consultation. After a careful examination, he expressed to me an opinion identical with that I had myself already formed—very guarded and indecisive. I now determined to keep Miss C. under observation for a while, in the city—and this for a twofold purpose, that I might perhaps gain an additional clue to the true character of the case, and that if I decided to operate, the patient might be previously prepared for it by special prophylactic treatment, and by becoming accustomed to the change of local climate and surroundings—each of these being points to which I attach extreme importance in operations about the pelvis. Under appropriate measures a chronic cough which had for some time existed, and which might have occasioned subsequent disturbance was made to disappear, and under the prophylactic treatment alluded to above, the bowels, which had been habitually constipated, became perfectly regular.

After mature reflection I decided to operate, being persuaded that the tumour, whatever its nature, would, unremoved, eventually destroy the patient. I will not say that I was absolutely certain of its character; I have now seen too much of abdominal tumours to believe in absolute certainty of diagnosis in any case, no matter with what care examined. Instances enough are on record, even in these days of anæsthesia and the sound, of the most astonishing disclosures upon an exploratory incision. I have myself seen a celebrated foreign gynæcologist tap a psoas abscess for an ovarian cyst, and have been told by one of our own best ovariotomists that he himself has once performed the section only to find a pregnant uterus. The cases where this organ or the bladder have been punctured by the trocar, where in pseudo-cyesis the abdomen has been opened and no tumour found, and where mesenteric or omental disease has simulated a removable tumour, have been too numerous not to put us on our guard; and it is besides well known that in most of the cases where removal of the uterus has been attempted or effected, the operation was commenced with the intention of removing an ovary. In but a few of these cases has the surgeon approached his task with the conviction or even expectation of finding extensive uterine disease, and under these

circumstances performed his operation deliberately and with sang froid. I can only say that I expected to find, as I did find, my case very unlike any that I had ever seen before, and that I never for a moment entertained the thought of not completing the operation after the first incision had been made.

I had retained the patient under observation for a month since the catamenia were last present. They had previously been regular, but a day passed, two, a week, without their reappearance, suppression having undoubtedly been caused by the patient's anxieties. I therefore appointed an hour for the operation, and at the very moment the ether was about being administered, and the patient almost in a frenzy of alarm, the menses suddenly appeared. A week's longer delay, therefore, became advisable.

I have spoken of the patient's alarm. She had at first viewed her prospect as hopeful, but as the day of trial approached, her courage entirely failed, and I was compelled, as I consider it is often our duty in desperate cases to do, to take the sole responsibility of advising the operation and carrying it into effect; herein differing from many of the profession, who make their only standard of necessity the request or the supplications of a patient. This is not the rule in many of the severe operations of general surgery, where the patient places himself, or has been placed, under control, as at an hospital. In my patient's unbounded gratitude, now that she has been saved from the fate that had been impending, I find my sufficient excuse and my reward.

I finally operated on the 23d of September, assisted by Drs. Dix, Langmaid, and Tyng, Dr. Dix kindly taking charge of the etherization; to their skill, courage, and patience, much of my success is undoubtedly due. The temperature of the room was 66° Fahr., as nearly as possible to which standard it was kept during the whole of the after-treatment. The bowels had been moved, and care taken that little or nothing had entered the stomach during the forenoon. Miss C. came readily under the influence of the anæsthetic; the bladder was emptied by catheter, and an incision of five inches made into the abdominal walls from just below the umbilicus downward, keeping within the track of the right rectus muscle. The several layers of integument, fascia, muscular tissue, and peritoneum were carefully divided upon a director, and the tumour exposed, almost completely filling the cavity of the abdomen. Its colour was of a very dark purplish, and the omentum was adherent to the greater portion of its circumference. The presence of these adhesions, and of still others at the sides of the mass was ascertained while the opening was still but slight, by the introduction of a sound. The omentum was highly vascular, some of the vessels being of very great size, resembling in this respect, and in appearance, those of the placenta, and directly communicable with the substance of the tumour. Some few of them were ligated by wire before division, and others divided *en masse* by scissors and afterwards secured by wire ligatures and torsion. Upon the left of the abdominal tumour and deep down there were other extensive adhesions to the peritoneum, which were partly broken down and partly severed. The mass was now found continuous with another also of large size, and of very irregular outline, completely filling the cavity of the pelvis. To manipulate the latter while the abdominal portion was still attached proving very difficult from its weight, their separation was effected by the ecraseur, merely for convenience' sake, and the external opening enlarged

by half an inch, to allow extraction. The pelvic mass was found largely attached laterally, the morbid adhesions being chiefly to the left, very firm and vascular. It was lifted up with great difficulty sufficiently to allow a clamp to be passed beneath it; this protected the vaginal septum from being opened, the broadened cervix was after much taxis got wholly within its grasp, and the instrument fastened tightly. Excision was then accomplished by the ecraseur, with the result, so firm were the tissues and so little the spare room, of opening up the jaws of the clamp throughout nearly the whole of its extent, so that it fell from the stump the moment the tumour was cut away. It was now evident enough that the division had been of uterine tissue, though to what extent it was impossible to ascertain without dissection of the tumour. Upon some six additional open vessels wire ligatures were placed, several more were twisted, and the operation was practically completed. So free, however, was the oozing from the extensive surfaces of adhesion that an attempt was made, at Dr. Langmaid's suggestion, to check it by the application of alcohol, but it proved insufficient. I feared that the ordinary styptics, like the actual cautery, might produce a slough, and therefore determined to try the effect of long exposure to air. No less than three hours were allowed to elapse from the commencement of the operation before the external wound was closed. During this period it became necessary repeatedly to empty the cavity of the pelvis of the blood that had collected. I endeavoured at first to do this by suction through a syringe, but its canal soon became clogged by coagula. A silver spoon was for a while substituted, but it finally became necessary to fall back upon sponges, which I had hoped to avoid, because they are thought by many to have an especially irritative and detrimental action upon the tissues of the pelvis. It will be seen, however, that no such injurious effect ensued. The incision was closed by the insertion of five wire sutures, passing through the peritoneum. No superficial sutures were employed, nor was adhesive plaster, or any other dressing, resorted to throughout the whole after-treatment, the abdominal integument being allowed to remain perfectly nude, only being protected from the bed-clothes by an appropriate wooden frame.

During the operation, the pulse had several times flagged somewhat, but the ether was continuously administered to the extent of two and a half pounds.

A few drachms of brandy and water were now cautiously administered, and henceforth, with the exception of a pretty full diet, and the constant employment of quinia and the muriate of iron, the treatment was strictly expectant. The diet was, for the first day, nothing but ice; for a day or two subsequently, flour porridge with milk, or milk gruel, repeatedly given. From this point, greater latitude was allowed; twenty-four pounds of beef being consumed during the first month. From the outset the pulse hardly exceeded 100. There was no nausea or vomiting, but very little pain, but little flatulence, and scarcely any jactitation. Sleep was easily insured by the application of a wet compress over the eyes. The water was constantly drawn by catheter until the third week, to prevent any effort on the part of the patient, and on the fourth day, a suppository of half a grain of morphia was introduced into the rectum to prevent pain and to insure its quiet. The bowels were moved by an enema on the sixteenth day, and of themselves naturally on the eighteenth. For ten days after the operation, no motion whatever of the body was permitted; in spite of all the care that was taken, the urine was so freely secreted that the bladder overflowed itself several times, and in consequence, the sacrum

thus becoming wet, I discovered on the eleventh day a slight slough in this region, which was at once and with surprising rapidity healed by Brown-Sequard's and Chapman's alternate applications of heat and cold. Upon the third day, it was evident that adhesion of the lips of the abdominal wound had completely taken place; there had never been any gaping of it from the very beginning; on the tenth day the wires were untwisted, and on the thirteenth and fourteenth they were removed.

The convalescence was uninterrupted. On the fifth day Miss C. begged to be allowed to sit up. On the twenty-first she did so for the first time. On the twenty-eighth she was out of bed, and on the thirty-seventh she returned home to Malden.

Having an operation to perform in the neighbourhood, I called at her house ten days after, on the 9th of November, with Dr. Brown, of Stoneham, and found her perfectly well, getting upon and off the bed without assistance, walking about the house with comfort, and very happy. She had apparently gained many pounds in flesh. I now made the first vaginal examination since the operation, and found the cervix reduced to a mere nodule, button-shaped, and very much smaller than I expected to find; the explanation being, that upon lifting the heavy pelvic mass sufficiently to put on the clamp and ecraseur, the cervix had been so stretched upwards as to make the excision encroach much lower upon its substance than would otherwise have been possible.

From the date of the operation until October 11th, eighteen days subsequently, and twenty-six days after the last appearance of the catamenia, there was no discharge whatever from the vagina. There now occurred a sanguineous effusion, attended by feelings of lassitude, backache, etc. etc., lasting thirty hours, and being an evident attempt at the re-establishment of menstruation; a very curious circumstance, and of great physiological interest, when it is recollected that the uterus and both ovaries had been removed. The ensuing period has been passed without its recurrence.

The case above reported seems to have been one of the so-called fibro-cystic disease of the uterus, which has been described by West,[1] Kiwisch,[2] Paget,[3] and others. There is a difference of opinion as to whether the softened portions result, as seems to have been the case in the present instance, from the softening, breaking down, or degeneration of fibrous tumours occupying the abdomen, and therefore subject to less pressure than when in the pelvis, or whether the disease is entirely distinct and separate in character from ordinary fibrous tumour. Fibro-cystic disease is considered by obstetric writers, wrongly, I think, to be exceedingly rare. Graily Hewitt, for instance, in his recent work, says:—

"These cases are very rare, and it seems almost impossible to say how they are to be distinguished from cases of ovarian tumour during life, the physical signs and the symptoms so closely resembling those observed where composite tumours of the ovary are present."[4] And again, the disease "is so rare, that we cannot expect to be able at present to lay down general rules as to the treatment. It has never, so far as I am aware, been diagnosticated during life."[5]

[1] Lectures on Diseases of Women, London, 1858, p. 268.
[2] Klinische Vortrage, vol. i. p. 455.
[3] Lectures on Surgical Pathology, ii. p. 138.
[4] Diseases of Women, 1863, p. 403.
[5] Ibid., p. 575.

It was evidently present in Parkman's fatal case, to which I shall hereafter refer, in Sands', and in Buckingham's; in Peaslee's, the fluctuation was thought to be occasioned by dilatation of the uterine sinuses.

By the kindness of Prof. Calvin Ellis, to whom the tumour was submitted for examination, I am enabled to subjoin a careful scientific description. The tumour weighed in all thirty-seven pounds; the pelvic mass weighing eight, and the abdominal sixteen, after thirteen pints of fluid had been carefully drawn from it. It was exhibited to the Suffolk District Medical Society, on Sept. 30th, by Prof. J. B. S. Jackson, and its character and relations demonstrated. It is now in the museum of the Medical College.

"The mass of solid tumours was so irregular that it resembled no organ, but the presence of two well-marked ovaries with the corresponding Fallopian tubes, made it evident that a large part of the uterus had been removed, so deformed by the new growth, as to render it unrecognizable except by its appendages.

"In the right ovary was a recent corpus luteum and several smaller cysts. One of the latter contained blood, another a whitish fluid.

"On making an incision at the point where the mass was separated from the subjacent organ, a narrow cavity was opened about four inches in length, lined with mucous membrane, and smeared with bloody fluid. The lower part had a somewhat rugous appearance. A probe passed through one of the Fallopian tubes, and entered its upper extremity. It was evidently the cavity of the uterus itself lengthened and distorted by the new growths, mingled with which was more or less of the uterine tissue. There were about forty tumours ranging from two or three lines to perhaps four inches in diameter. They presented the usual appearance of fibroid growths of the uterus, though a number of considerable size were so filled with calcareous matter as to render the saw necessary for their division. Some were markedly pediculated.

"The large fluctuating mass attached to the broad ligament consisted of two principal tumours with others of smaller size springing from them, and many of them pediculated. They were externally quite vascular, like those connected with the uterus.

"All were of a fibrous character. The fluctuation was owing to two causes, serous infiltration and cystic formations. Some portions had an almost gelatinous appearance, owing to the amount of infiltration, and many others contained irregular cavities filled with clear serum, bloody fluid, or perhaps blood. Though apparently formed by the separation of the fibres of which the masses were composed, some of the cavities had smooth lining membranes closely resembling those of ordinary cysts.

"The above change was similar to that sometimes seen in well-marked fibrous tumours of the uterus, and this may have had such an origin, but it is more probable that it belonged to the broad ligament.

"This was the opinion of Dr. J. B. S. Jackson, who has a specimen showing a true fibrous tumour in the broad ligament."

It will be perceived that in operating upon the above case, I ventured to take just the opposite course to that lately laid down by an eminent operator, Spencer Wells, of London, as the rule to be pursued in fibro-cystic uterine disease.

"If the operation has been commenced," he says, "and the dark aspect of the tumour is observed, it would certainly be advisable not to do more than tap one or more of the largest cysts before examining attentively the connections between the uterus and the tumour. If these should prove to be very intimate, it will be the unpleasant duty of the surgeon to desist from any attempt to do more, and to close the wound as soon as possible."[1]

And I ventured to disregard the opinion of another noted London surgeon, Mr. Jonathan Hutchinson. In speaking of a case where "the tumour is an enormous one, reaching higher than the umbilicus, and distending the abdomen as if in the last week of pregnancy," the general health of the patient remaining tolerably good, Mr. Hutchinson remarks that "it would of course under any such circumstances be madness to think of attempting any surgical treatment."[2]

A hospital surgeon has since asked me if, before operating, I had any expectation of the disease which in reality presented itself, and if I ought not to attribute the woman's recovery wholly to chance. To the first of these questions I have endeavoured already to answer in speaking of the difficulty of an exact differential diagnosis in this case, and of the course we so deliberately pursued. By the other I am reminded of a similar question put to me by another hospital attendant, some ten years ago. I had reported to one of our medical societies (the Suffolk District) a case of advanced carcinoma uteri, where, all other hæmostatics failing, I had controlled hemorrhage and prolonged life for many months by the free use of the actual cautery, an agent which so many of us have seen in daily use in Europe, and which, for one, I have constantly resorted to since the time referred to. At that time, however, it was considered too heroic practice for Boston, and the gentleman to whom I have alluded innocently asked if the case was reported as one of escape from accidentally perforating the peritoneum by the instrument employed.

I do not believe that my success in the present operation was wholly owing to chance, for there were certain elements involved which I am accustomed to value. Had the patient died, I might have been blamed for wilfully incurring the risks I have already shown to be generally thought inevitable for extirpation of the uterus when *in situ*. On the other hand, some of these risks, provided we properly understand them, are, to a great extent, within our control.

But first let me state briefly the statistics, so far as they are accessible, of the operations hitherto performed.[3] I have to return my thanks to

[1] Diseases of the Ovaries, London, 1865, vol. i. p. 362.

[2] Report on the Enucleative Treatment of Uterine Fibrous Tumours, Medical Times and Gazette, 1857, p. 170.

[3] Spencer Wells' Uterine Cases, so unsuccessful, just published in the first volume of his work on *Diseases of the Ovaries*, were, with a single exception hereafter tabulated, merely removal of outgrowths by excision or enucleation, and not of the uterus itself.

Drs. Clay, Kimball, Burnham, and Buckingham for unpublished information concerning their cases.

	Operations.	Deaths.
Clay[1]	3	2
Heath[2]	1	1
Burnham[3]	9	7
Kimball[4]	3	2
Parkman[5]	1	1
Peaslee[6]	1	1
Koeberle[7]	1	0
Baker Brown[8]	1	1
Wells[9]	1	1
Sands[10]	1	1
Buckingham[11]	1	1
Storer	1	0
	24	18

Percentage of recoveries 1 in 4, or 25 per cent.

I also append the causes of death, so far as I have been able to ascertain them.

	Fatal Cases.	Causes of Death.				
		Shock.	Hemorrhage.		Inflammation.	Accident.
			Primary.	Secondary.		
Clay,	2	. . . .	1 (2 hours)	. . . .	. . . .	1 (13th day)
Heath,	1	1 (17 hours)				
Burnham,	7	3 (1st day, 1st day, 2d day)	. . . .	. . . .	4 (3d day, 4th day, 4th day, 5th day)	
Kimball,	2	. . . .	. . . .	1 (3d day)	1 (10th day)	
Parkman,	1	. . . .	. . . .	1 (12 hours)		
Peaslee,	1	. . . .	. . . .	. . . .	1 (8th day)	
Baker Brown,	1	. . . .	. . . .	1 (2d day)		
Wells,	1	1 (4th day)				
Sands,	1		1			
Buckingham,	1	1 (1st day)				
	18	6	2	3	6	1

[1] Transactions of Obstetrical Society of London, vol. v., 1864, p. 66.

[2] London Med. Gazette; Boston Med. and Surg. Journ., Jan. 1844, p. 494.

[3] Nelson's Northern Lancet, Jan. 1854; Boston Med. and Surg. Journal, Oct. 1865, p. 214, and MS. letter.

[4] Boston Med. and Surg. Journ., May, 1855, p. 249.

[5] Am. Journ. Med. Sciences, April, 1848. [6] Ibid., Jan. 1856.

[7] Med. Times and Gazette, Feb. 1865. This is spoken of as Koeberle's sixth case, but it is merely the sixth of his abdominal sections, and apparently his only case of extirpation of the uterus. He has lately published a work on the removal of fibrous tumours of the uterus, which as yet I have been unable to obtain.

[8] Transactions of the Obstetrical Society of London, vol. vi., 1865; Am. Journ. of the Med. Sciences, Oct. 1865, p. 484.

[9] Diseases of the Ovaries, vol. i. p. 350.

[10] New York Medical Journal, Dec. 1865, p. 188.

[11] Operation performed at City Hospital of Boston. Case as yet unpublished.

Or, to present these causes more minutely:—

	Causes of Death.	Ultimate Cause.
1. Clay,	Hemorrhage, in 2 hours.	Divided by knife, not by ecraseur.
2. "	Accident, 13th day.	Dropped upon floor by the nurse.
3. Heath,	Shock, in 17 hours.	Divided by knife, not by ecraseur.
4. Burnham,	" in 1 hour.	Operation long delayed.
5. "	" in 4 hours.	" " "
6. "	" 2d day.	" " "
7. "	Peritonitis, 3d day.	" " "
8. "	" 4th day.	" " "
9. "	" "	" " "
10. "	" 5th day.	" " "
11. Kimball,	Slipping of ligature and hemorrhage, on 3d day.	Divided by knife, not by ecraseur.
12. "	Inflammation, on 10th day.	No apparent prophylaxis.
13. Parkman,	Slipping of ligature and hemorrhage, in 12 hours.	Divided by knife, not by ecraseur.
14. Peaslee,	Peritonitis, on 8th day.	Long incision. Strangulation of intestine, protrusion between the sutures, and gangrene.
15. Baker Brown,	Slipping of ligature and hemorrhage, on 2d day.	Divided by knife, not by ecraseur.
16. Wells,	Shock, on 4th day.	Ecraseur bent, clamp broke, and "copious hemorrhage from very large vessels."
17. Sands,	Hemorrhage, immediately.	Divided by knife, not by ecraseur.
18. Buckingham,	Shock, on 1st day.	" " "

In several of the above cases, moreover, chloroform was given, which, for the ordinary purposes of surgery, while it lessens or annuls the shock from pain, is, of itself, undoubtedly attended by a certain amount of depressing action of which sulphuric ether is innocent. In allowing this fact, I make no recantation of my well-known preference for chloroform in midwifery; for I still believe that it is here, when properly exhibited, far superior to ether and perfectly safe, for reasons that I stated in my communication to the Massachusetts Medical Society at its annual meeting in 1863.[1]

It will be perceived from the above statement of the causation of the fatal cases, that in all of them the fatal result might apparently have been prevented. In some of these operations, the uterine character of the disease has hardly been suspected until the abdomen had been opened; in others, its completion was rendered necessary from hemorrhage consequent upon an attempt at paracentesis. Compulsory operations, or those that originally are unintended by the surgeon, are seldom performed as calmly or carefully as those to which he has made up his mind.

The dates at which the operations, successful and unsuccessful, were performed are as follows:—

[1] Boston Med. and Surg. Journ., Oct. 1863, p. 249. Eutokia, The Employment of Anæsthetics in Childbirth, Boston, 1863.

1.	Clay,	Aug. 1843.	Fatal.
2.	Heath,	Nov. "	"
3.	Clay,	Jan. 1844.	"
4.	Parkman,	" 1848.	"
5.	Burnham,	June, 1853.	Successful.
6.	Kimball,	Sept. "	"
7.	Peaslee,	" "	Fatal.
8.	Kimball,	Date not given, but prior to 1863.	"
9.	"	" " " "	"
10.	Burnham,	" " " "	"
11.	"	" " " "	"
12.	"	" " " "	"
13.	"	" " " "	"
14.	"	" " " "	"
15.	"	" " " "	"
16.	"	" " " "	"
17.	Wells,	Oct. 1861.	"
18.	Clay,	Jan. 1863.	Successful.
19.	Koeberle,	April, "	"
20.	Baker Brown,	1864.	Fatal.
21.	Burnham,	Sept. 1864.	Successful.
22.	Sands,	June, 1865.	Fatal.
23.	Buckingham,	" "	"
24.	Storer,	Sept. "	Successful.

From the above it appears that, prior to 1863, there had been 17 operations and 15 deaths, the mortality being 88 per cent.; whereas, at the present date, there have been 24 operations and but 18 deaths, the mortality being reduced to 75 per cent. It must not be forgotten that, of the last seven operations, four, or 57 per cent., have been successful.[1]

The dates of the successful operations are as follows:—

1. Burnham . . .	June, 1853.	4. Koeberle	April, 1863.
2. Kimball	Sept. "	5. Burnham . . .	Sept. 1864.
3. Clay	Jan. 1863.	6. Storer	" 1865.

Four out of the six, or two-thirds of the successful operations are American, and of these four, all of them have been performed in New England—one in Connecticut, one in Rhode Island, and two in Massachusetts.

The size of the mass removed in the successful cases is as follows:—

Burnham	8 and 16 pounds.
Kimball	"Not exceeding 10 pounds."[2]
Clay	11 pounds.
Koeberle	Not stated, but apparently not very large.
Storer	37 pounds.

It would have seemed, from the earliest of the above statistics, that the operation ought hardly to be approved, were it not remembered that the disease, if left to itself, usually sooner or later proves fatal. Even Burnham, who, by reporting two cases of success, has taken the lead in this direction, seems to have become discouraged by his own large percentage of mortality.

[1] Reliance must never be placed on statistics based promiscuously on varying methods of practice. It is the result under the best treatment that should settle the question of an operation.

[2] MS. Letter.

In reporting his first case, which was published as the "removal of an *ovarian* tumour," he had remarked: "Although this case terminated favourably, I would not easily be induced to make another attempt to extirpate the uterus and ovaries, or even to remove the uterus under almost any condition; and the operation should never be attempted without due consideration of the consequences of submitting a patient to such formidable risk."[1] In his subsequent publication, some six weeks ago, he says:—

"I have declined, for a number of years, to operate on fibrous tumours, except in a single case. In my first operations I attempted to remove these, but generally gave them up, after exploring the parts, as too dangerous to complete. I cannot now recommend the removal of fibrous enlargements of the uterus, and all the cases I have seen involve the uterus in their growth."[2]

"It may be remarked," Dr. Burnham writes to me, "that all my cases were undertaken as a *dernier resort*, and in general all the patients were much reduced by long suffering and impairment of vital function, to which cause I think that the great mortality attending this class of operations may be attributed."

I hope now to show that other dangers, as well as that here referred to, are in great measure and generally within our control, and that the proceeding thought necessary in many other cases, as in that of Dr. Deane, of Greenfield,[3] and in four communicated to me by Dr. Burnham from his own practice, where the operation begun has been desisted from, through a belief in its impracticability, may hereafter be avoided. The mere fact that patients generally recover after such exploratory incisions is of little satisfaction, provided the disease itself still remains.[4]

[1] Worcester Journal of Medicine, Feb. 1854, p. 47.

[2] Boston Medical and Surgical Journal, October, 1865, p. 214.

[3] Boston Medical and Surgical Journal, 1848, vol. xxxix. p. 221.

[4] With regard generally to a more frequent resort to exploratory incisions than now generally obtains, I cannot express myself too favourably, and I believe that upon this point I express the opinion of the best ovariotomists. There are some pressing cases, where it is absolutely impossible to be positively certain as to the existence of a tumour, let alone its differential diagnosis, even if anæsthesia has been employed. The fact that, upon incision, no tumour has been found in some such cases, has been made altogether too much of as an argument against section. As well might it be said that the cavity of the uterus is never to be explored by sponge tents, because in many cases of uterine hemorrhage where they have been employed, only negative evidence has been attained. Exploratory incisions, just as with operations for hernia, are attended with but little danger; they heal readily except where ascites is present, and even here much more frequently than would be expected. They might in many instances indicate the existence of curable diseases, where the patient must otherwise, for want of an exact diagnosis, in no other way possible, be allowed to die. In performing the section, for exploration or for removals, I differ from most operators, in that I prefer making it in the track of a rectus muscle rather than in the linea alba, being thus much more certain, from the nature of the tissue divided, of a primary reunion.

"The dangers attendant upon the removal of so important an organ as the uterus," says Churchill, "are the following, and they cannot be *lightly* estimated:—

"1. The first danger is from the shock given to the constitution, which may even prove fatal. Dr. Blundell thinks that this is felt the most when the supports of the uterus are divided, and when the mass is extracted from the pelvis. The shock, so severe when the uterus is *in situ*, is very slight when the uterus has been displaced by inversion.

"2. Dangerous or fatal hemorrhage may occur after the extirpation of the uterus *in situ*," and may be primary or secondary.

"3. The parts within the pelvis or the peritoneum may be attacked by inflammation, compromising the life of the patient."[1]

That is to say, the dangers are chiefly from pure nervous shock; hemorrhage, immediate or secondary, from the slipping of a ligature or ulcerative opening of vessels; excessive reaction, or inflammation subsequently lighted up, generally by appreciable causes.

Can any of these sources of danger be counteracted, or, what is far better, averted?—for here, as everywhere in our art, the prevention of evil is far better than its cure. I think I can show that each of the elements referred to may be guarded against.

I. The shock of any severe or capital operation, and pelvic operations are particularly severe in proportion to their extent, is seldom uncomplicated; making, of course, due allowance for the general constitutional condition of the patient previous to the operation, it is generally found owing to several causes.

The causes referred to are the following—producing alone, or in combination with each other, an impression, direct or by reflexion, upon the cerebro-spinal system, by which its action is for the moment or permanently paralyzed; death occurring, where the case proves fatal and there still remains a sufficiency of blood for the heart to propel, from asthenia, the heart ceasing to act for want of power:—

1. Excessive pain, perhaps accompanied by
2. Excessive fear or anxiety.
3. Hemorrhage, not necessarily, however, excessive.
4. Injury to a nerve or nerves, as by division or inclusion in a ligature, and probably in proportion to the suddenness or rapidity of its infliction.
5. The removal of abnormal pressure upon nerve or nerves, or upon nerve-substance, whether by solid or by fluid pressure, as by excited or excessive vascularity, and, also, probably in proportion to the rapidity of such removal.
6. And we add, also, to these, as a predisposing cause, the existence of a previous low degree of general vitality, whether as anæmia or toxæmia.

[1] Diseases of Women, p. 318.

Now each and every one of these elements of danger may be provided against beforehand.

In the first place, the necessity of endeavouring to correct or to improve an impoverished or poisoned condition of the blood, so far as possible and wherever possible, before subjecting any patient to the dangers of a capital operation, it would seem, must be recognized by every surgeon. Would that it always were!

Secondly. The action, at times so evident and so deadly, of pain and of present dread or alarm may, also, be always counteracted. Would, again, that they always were!—for here, also, might the ratios of mortality be lessened. Under anæsthesia, pain and fear are alike placed in abeyance. The patient falls asleep in hope, and wakes in joy at its fulfilment. There seems, moreover, a direct supporting effect upon the nervous system from the anæsthetic—by which I mean sulphuric ether, and for every operation save the conduct of childbed, as I have already stated, where I believe chloroform to be specially indicated. It is, of course, to be presumed that the agent is pure and is properly administered, under which conditions it would seem that the nervous system does in reality become peculiarly tolerant of shock.

Thirdly. Hemorrhage, necessarily so profuse in former days when the knife alone could be employed, is reduced to a minimum by the use of the ecraseur. Ligature of a cervix stump, just as that of an ovarian pedicle, no matter how skilfully or tightly adjusted, can by no means insure against an alarming loss of blood at or immediately after excision. Its employment affords no guarantee against the reopening of a bleeding orifice by the knot slipping, or by its cutting by ulceration into a vascular canal. These risks, thanks to Chassaignac and to the great Scotch champion of hæmostasis by pressure, whether by needle or metallic ligature, may now every one of them be escaped.

Fourthly. The possibility and the advantage of slowly separating the organic connections of a tumour have to a certain extent, though but to a certain extent, been already recognized in surgery. In the case of intrauterine and vaginal polypi, of inversion and the like, the ligature has been mainly preferred to the knife; the chief advantage claimed for the latter being, that where the sources of its consequent hemorrhage could readily be reached, the risks dependent upon purulent and septic discharges, liable by absorption to produce pyæmia, from an ulcerating ligature, were avoided. Now, with the ecraseur we can destroy continuity as slowly as we please, consistently with a reasonable submittal of our patient to other sources of danger—as, for instance, to prolonged exposure of the peritoneal membrane to the air and other external agencies. Upon this point I cannot help differing from my esteemed and eminent friend, Dr. Walter Channing, who, from having seen it used in my own hands for dividing a broad ovarian pedicle, has incontinently condemned the

ecraseur for any purpose whatever,[1] and without any personal experience of his own.

In the case referred to, the fatal result from peritonitis on the fifth day was clearly owing to my having listened to the advice of others, contrary to my own convictions, and having used silk ligatures brought out externally, instead of, as here, metallic ones dropped into the pelvis, and there left *in situ*.

By slowly tightening the chain of the ecraseur, we not only lessen the chances of hemorrhage, by rendering the wound more of a contused than an incised one, we not only gradually divide any nerve-fibres that may be included, and gradually interrupt the to-and-fro nerve-currents that are in transmission, but we as gradually interrupt the current of the arterial circulation, and prevent any sudden backward pressure of the fluid column upon the heart—a pressure that must be present in every case of sudden interruption of the circulation, more especially from laceration or contusion, where hemorrhage does not occur, and that is evidenced, grossly, by the click heard, the bursting sometimes seen, of service-pipes in which the current of water is suddenly checked. The elasticity of the arterial walls is not sufficient wholly to neutralize this action, and its occurrence must certainly tend to increase the dangers from shock.

Fifthly, and finally. I am not sure that it may not be good practice to allow the tumour, detached, to remain for a moment or two *in situ*, as was done accidentally in the case now reported. The mass was so heavy, much more so than would have been anticipated from its size, that I remained under the impression that division had not been effected after the loop of the ecraseur had entirely passed through its groove, and the screw was turned until the chain was snapped at its distal extremity. The tumour was then removed, but its pressure was not taken from the surrounding tissues until some little time after all organic connection with them had been severed.

So much, then, for the first of these possible prophylactics of danger in uterine extirpation, when *in situ*, as arising from shock.

II. As an incidental element in the production of shock, I have already considered some of the features of hemorrhage, as controllable by anticipation. There are others. Not merely may the chance of hemorrhage during the operation, or of non-puerperal flooding, as it might justly be called, be prevented, but its recurrence at a subsequent period, where, the abdomen being closed, and its whole extent taking the place of the absent uterine cavity, the risks of concealed hemorrhage become so fearful. I need merely refer to the magnificent work upon acupressure just published by Prof. Simpson, the last, the boldest, and the best of his contributions to science and practical art, if this may be said of suggestions

[1] Boston Medical and Surgical Journal, January, 1865, p. 494.

and discoveries "each of which were worth a lifetime to have made;"[1] its perusal will convince the most skeptical, of what every man must acknowledge who tests the question in practice, that a safer way of preventing hemorrhage than by silk or organic ligature is by metallic pressure, just as metallic sutures are more efficient than the others in insuring the great end of all surgery, a union by first intention.

III. The third of the dangers so tersely enumerated by Churchill is that from inflammation, and this, it will be found, may be as easily guarded against as those already considered.

A certain proportion of the cases of uterine extirpation have died during the first reaction, and in consequence of its severity; another class from subsequent excitement or depression of the circulation generally, from whatever cause; and still a third, from a local excess of circulatory action or local inflammation, also established by a variety of causes. Clay has attempted to reduce these risks, similarly obtaining in ovariotomy, to a formula, by recognizing the existence of critical days. Thus he says, when speaking generally of abdominal sections, of which he has now made no less than one hundred and sixteen—

"If the patient does not sink immediately from shock, that is, within the first twenty-four hours after operation, the first critical day will be the third, and the cause of fatality, if the case so terminates, will be unsubdued inflammation. The next critical period is the sixth day, when I first apprehend danger after the subsidence of peritoneal inflammation, in the elder class of females particularly, from prostration; should, however, the case be young, this termination may be deferred to the ninth, or next critical day, which is the usual period of prostration for younger females. If the patient passes this point, it assumes a far more favourable prospect for recovery, and the critical days become of less consequence; nevertheless, I have seen the twelfth usher in some very troublesome symptoms, consequent on the loosening or entirely throwing off the ligatures, and in one or two cases I have seen about this period a secondary attack of peritoneal inflammation, which, if not actively and carefully managed, or foreseen and prevented, may wreck the patient."[2]

"If not foreseen and prevented," says this great authority. The words are well worth remembering. The preparation of the patient for the operation, by a previous careful course of medical treatment, is, says the same writer, "of immense importance, and will greatly facilitate the movements of the operator when called upon."[3]

This preliminary or prophylactic preparation is of a threefold character: To raise the general tone of the system; to prevent any tendency to toxæmia, or to counteract such if already present; and, while removing any source of irritation from the digestive organs, to procure a condition therein of healthy quiet. The first and second of these indications I find

[1] Simpson's Obstetric Works, Preface to American edition.

[2] Transactions of the Obstetrical Society of London, vol. v., 1864, p. 63.

[3] Handbook of Obstetric Surgery, 1856, p. 176. The same necessity has been insisted upon by Dr. Clay in almost every one of his numerous papers upon abdominal section.

to be best fulfilled by the use of the muriate of iron, given not merely as a tonic, but, as has been shown by Simpson in his admirable essays upon the identity of puerperal and surgical fever,[1] as a special depurant. The third indication is met, better perhaps than in any other mode, by the exhibition of ox-gall, which not only removes by its solvent action any scybalous masses, even if adherent to the intestinal coat, and prevents flatus, so often initiative of a peritonitic attack, but seems in cases of hepatic disease, functional or organic, to take the place, in some respects, of the natural secretion. The advantage of the ox-gall treatment preliminarily to any severe pelvic operations has been often insisted upon by Dr. Clay. I have myself more than once called the attention of the profession to its advantages,[2] and have long been in the habit of resorting to it in practice. In addition to the other good effects from it, I am inclined to think that under the previous use of ox-gall the intestines are less likely to escape or to force themselves through an abdominal incision.

I have implied that some of the various secondary causes liable to excite inflammation may be prevented. Such is, for instance, the neglect to which I have just referred, of procuring a thoroughly soluble and healthy condition of the bowels prior to the operation. It is on many accounts advisable, indeed necessary, to prevent any peristaltic action of the intestines for many days. If they contain excreta, particularly if these are ancient, their passage may be accompanied by imminent risk; if, on the other hand, such are still longer retained under the use of opium, equal or greater dangers may occur. The processes of decomposition, in abeyance while the pelvic circulation was as yet uninterfered with, may suddenly be set up, and every morsel of feces act as a nidus of destructive or toxæmic force. One need only read the records of cases that have been reported, to be convinced that just upon these points has life depended, and that from their neglect more than one of the successful cases came very near being fatal. Take, for instance, Burnham's first, where the condition of the patient for some days subsequent to the operation was truly terrible. Here, on the third day, there was "uneasiness of the bowels;" on the sixth they were so "distended as to tear open the adhesions, which had been firm for three days, suppuration being abundant and offensive from the wound and vagina." On the seventh day "all the symptoms indicated rapid dissolution." On the eighth day "the patient had a copious evacuation of dark, impacted scybala, which must have remained in the intestinal canal for many days, notwithstanding there had been what seemed to be free evacuations from the entire extent of the canal several times since the operation;" these discharges being of themselves to be depre-

[1] Clinical Lectures on Diseases of Women, p. 176.

[2] As, for instance, in my paper upon the Surgical Treatment of Amenorrhœa, Amer. Journ. of the Med. Sci., Jan. 1864.

cated immediately after so severe a shock. "Much prostration attended the evacuations, the patient being kept from sinking only by the free use of stimulants."[1]

The bladder must, of course, be kept constantly voided, and for many days artificially. There is a diversity of opinion as to whether a self-retaining catheter, as that of Sims, or the frequent introduction of the ordinary form, is best.[2] When the flow of urine becomes more than usually copious, this being an evidence that the kidneys have recovered from any state of extreme congestion, and as emunctories of excretory matter are actively at work, we may probably consider it as "always a favourable sign."[3]

If the woman has not yet passed the climacteric, which to have done would so far be in her favour, it is necessary to take the time of occurrence of the menstrual molimen into consideration. At such time the tendencies of the circulation are towards the organs of the pelvis, which are then more or less congested, and therefore more prone than usual, upon injury, to the occurrence of hemorrhage.

The best time for operation is probably very shortly after the catamenia have ceased, and this point, it will have been noticed, was acted upon in the case now reported. In this connection, I would call attention to the remarkable fact that an effort at menstruation, attended with slight hemorrhagic flow for the greater part of a day and a half, occurred nearly at the regular period after the last menstruation prior to the operation; not merely the uterus, but the ovaries, which are undoubtedly the initiative source of the menstrual effort, being now absent. The occurrence of this discharge purely from the tip of the cervix may throw some light upon that occurring from a similar seat in some instances of pregnancy; its ultimate causation in the present instance must be explained as the final oscillation of a pendulum, from which all motive force had been withdrawn.

Speaking, as I have done, of the prophylaxis by which we may reasonably hope to diminish the mortality of abdominal section, and its thus far most dangerous accompaniment, extirpation of the uterus, I should do wrong did I not express my opinion of certain points during section, hitherto deemed of the first importance. They are the following. It will be noticed that upon these points I differ from many operators:—

1. The temperature of the atmosphere.
2. The length of the incision.
3. The treatment of the stump, or the pedicle, if ovarian.
4. The closure of the external wound.

[1] Worcester Journal of Medicine, Feb. 1854, p. 45.

[2] See discussion upon this point at Obstetrical Society of London in 1863, Transactions, vol. v. p. 35.

[3] Clay: Transactions of Obstetrical Society of London, vol. v., 1864, p. 71.

I have already incidentally mentioned other points of very great interest. To these and to still others I will briefly refer.

1. The differential diagnosis once made, or decided to be impossible, the question of operation must turn upon the patient's history, her present condition, her own wish, and the surgeon's courage.

a. If the surgeon is not ready for *any* complication that the section may disclose, he is unfit *ever* to operate.

b. The wish of the patient must be mainly governed by her attendant's decision. An invalid, torn by contending emotions, and swayed by the conflicting advice of ignorant friends, cannot judge wisely for herself. The surgeon, the accoucheur, the physician have daily, and ought, to take the responsibilities of such decision.

c. Is death imminent without the operation, the chance of life it affords should be given; it being recollected that the more the vital powers have been undermined by delay, the less has this chance become.

d. If the tumour has rapidly become developed, while on the one hand the probabilities of the disease being malignant may be increased, so has the necessity for rendering immediate aid.

2. The diagnosis of malignant disease, of a multilocular cyst, of uterine complication, or of adhesions, is, under the circumstances now described, no necessary bar to the operation. Every surgeon of course desires that his cases should be promising, and free from complication; he dislikes the odium of an unsuccessful attempt, and accordingly is prone to "select" them. Thus Clay has been consulted for "sixteen hundred cases" of ovarian disease prior to 1863, and has operated but one hundred and sixteen times;[1] Baker Brown, in 1863, "has examined many hundreds, he might say thousands of cases,"[2] and in 1861 had performed section but in nine, then preferring less certain methods of treatment.[3] And yet, of the cases where the operation has been completed, perhaps as large a proportion of the most unpromising have succeeded as of the simple and uncomplicated ones; probably because of the more careful after-treatment that was supposed necessary. The excess of care in selecting cases to which I have referred may be well for the operator's reputation, but it is not always for the patient's advantage. Patients are frequently pronounced by physicians to be incurable, who are perfectly legitimate sub-

[1] Trans. of Obstetrical Society of London, v. p. 64. [2] Ibid., p. 73.

[3] Surgical Diseases of Women. The extent of the prevalent fear lest a case prove uterine, almost exceeds belief. During the past year I have received from New Hampshire by the kindness of Dr. McIntire, of Concord, an unilocular ovarian cyst, well pediculated, and without adhesions, the uterus being perfectly healthy, removed post mortem from a patient upon whom an operation had not only been advised against, but prevented, by a noted operator of my own State, on the ground that the case was one of undoubted uterine disease. I could mention similar cases, but they are probably familiar to most of my readers.

jects for operation. Abdominal section is still in its infancy, and objections formerly considered unsurmountable are now in practice found trivial. I must here quote a word from the last published work upon the subject, that of the present year, by Spencer Wells, to enter my protest against the too timid selection of cases he would inculcate. "I cannot," says Mr. Wells, "send forth this volume without a word of caution. A discovery which has triumphed over opposition of all kinds, honest and scientific, prejudiced and ignorant, may still be ruined by the support of rash, inconsistent, thoughtless partisans, whose failures do not reflect so much discredit on themselves as on the operation which they have badly performed in unsuitable cases. Indications are not wanting that ovariotomy has entered upon this phase of progress; and there is reason to fear that judicious men may be influenced by the outcry of the foolish, and that a triumph of surgery which has been won by great labour and care, may be arrested before it is complete, may even be converted into temporary defeat, by the indiscriminate support of zealous, but injudicious advocates."[1] Now, several of Mr. Wells' greatest successes have been cases where the diagnosis was doubtful; and, on the other hand, he is very averse to operating, or to completing an operation, where extensive adhesions are found to exist. Clay, of Manchester, on the contrary, believes that adhesions, however extensive, are of minor importance, unless deep in the pelvis. "When I first commenced my operations," he says, "I was inclined to think more seriously of adhesions than I do now; in fact, many cases were rejected at that time as unfit for operation, which, if now presented to me, I should not hesitate to operate on. Some of the worst cases of adhesion I ever had, recovered as well and as rapidly as any other."[2] So far as the relative success of these operators is concerned, Spencer Wells, fearing adhesions, has performed abdominal section for ovarian and uterine disease (1865) 130 times, with 80 recoveries,[3] or 61 per cent.; while Clay, disregarding adhesions, has performed this operation for ovarian and uterine disease (1863) 116 times, with 80 recoveries,[4] or 68 per cent.; a balance of 7 per cent. in favor of the bolder practice.

3. An operation determined on, the less previous manipulation the better. There is good reason to believe that many a case has been lost by merely allowing the abdomen to be unnecessarily kneaded by an interested or inquisitive circle of medical friends. Such manipulation would seem the surest possible way to predispose to an attack of peritonitis, were this desired.

4. The patient should have been prepared by previous medical prophylaxis.

5. She should have become accustomed to what I have called the local

[1] Loc. cit., p. xiv.
[2] Obstetric Surgery, p. 162.
[3] Loc. cit.
[4] Trans. Obstetrical Society of London, vol. v. 1864.

climate in which she is to remain after the operation. That is to say, a city patient transferred to the country should not be operated upon until some weeks of residence had elapsed, the same rule applying to a country patient transferred to the city. Of course the atmosphere of a private house is, all other things being equal, preferable to that of the best ventilated hospital; to say nothing of the chance therein of peritonitic infection from erysipelas or surgical fever. It may be said, on the other hand, in view of the immense importance of the after-treatment, that the best nurses are to be found in hospital wards; in emergencies, however, they can often be transferred from thence, should this be thought advisable.

6. The temperature of the room at the time of operation has been much insisted upon. For instance, my friend Prof. Elliot, of New York, in a late ovarian section at Bellevue Hospital, kept himself for a full hour, with a company of no less than twenty-seven medical men, in an atmosphere heated to between 90° and 100° Fahrenheit.[1] My own impression is that one of from 65° to 70° answers every practical purpose, and is much less debilitating both to operator and to patient.

7. That an anæsthetic should be given, I need hardly remark. This would of course be done, as much for the operator's convenience as for the patient's comfort. Not only, however, is suffering thus annulled, but there is reason to believe that, just as obtains in midwifery, the percentage of recoveries may be proportionately increased. I am inclined to think, moreover, and the remark applies to many other surgical operations, that it may be of advantage to keep the patient insensible for some time after the operation has been completed. In the case now reported, the anæsthesia was steadily continued for more than three hours. Much depends upon the method of administering the ether, for I believe that with attention to this point, the troublesome syncope, nausea, and vomiting, that so frequently ensue, and in the latter instance increase the risk of protrusion of the intestines, may be in great measure prevented, as in the present case.

8. The length of the incision has varied between extremes, each having its champions. My own practice is to make as short a one as seems possible to answer my purpose. In the present instance, the wound was but five and a half inches, extending from the umbilicus downwards, but not reaching the pubes, and yet it was fully sufficient for the extraction by a little taxis, of the enormous mass, without materially lessening its bulk. When the opening is extended towards the sternum, it is almost impossible to prevent the intestines from protruding during the operation, and to keep up their vital heat. I am satisfied that a frequent cause of subsequent peritonitis is from the excessive manipulation and chill to which the viscera are necessarily subjected in cases of the long incision; and

[1] N. Y. Med. Jour., Sept. 1865, p. 409.

that in other instances, the efforts at their retention or replacement are productive of the entanglement of loops upon each other and their subsequent strangulation; while in still others, like Prof. Peaslee's case of uterine extirpation, the fatal result is consequent upon an escape of the intestines between the sutures of the wound, and thereon strangulation and subsequent peritonitis or gangrene. By the short incision there is also a less exposure to the atmospheric air of those of the abdominal contents that are not protruded, and therefore somewhat less risk of shock or inflammatory action.

9. Some surgeons, particularly my friend Dr. Peaslee, have thought they found advantage in the employment of an artificial serum, with which to keep the viscera more thoroughly protected from external causes. I believe, however, that it is hardly necessary. Far better is it to direct attention to those external causes whose presence can be wholly avoided; as one of which, the wearing of rough signet rings, which in two instances I have seen introduced into the cavities of both abdomen and pelvis.

10. To the comparative non-importance of adhesions I have already alluded. Where they are absent, it is of course an advantage. Where present, they may be torn (best), cut by ecraseur (next best), or by the clean incision. In the latter instance, only, is there much risk of hemorrhage; to prevent or arrest which, if torsion is insufficient, more direct means become necessary, but it should be by acupressure or metallic ligature, and not by those of organic material.

11. The same remarks apply to division of the pedicle, if ovarian, and of the cervix, if uterine. Many of the deaths after these operations have been from slipping of ligatures, or from septæmia in consequence of arterial sloughs,[1] or from irritation produced by the presence, long continued or temporary, of organic sutures or ligating threads.[2] In Spencer Wells' fatal case of uterine extirpation, the stem of the ecraseur bent and it became useless, a clamp was applied and it broke, and there was copious and alarming hemorrhage; the case showing the necessity of having duplicate instruments of reliable construction. In one of Kimball's uterine cases, his third and last, death was occasioned by the slipping of a ligature on the third day, and consequent fatal hemorrhage.[3] The same occurred on the second day in Baker Brown's late unsuccessful case.[4] In Kimball's successful case, the ligatures were brought through the external wound and there remained eight months after, "causing considerable

[1] "Minute Morsels of Dead Flesh in the Raw Cavities or upon the Raw Sides of Large Wounds." Simpson's Acupressure, p. 43.

[2] The Law of Non-Tolerance of Living Tissues for the Presence of Dead Foreign Organic Bodies. Ibid., p. 478.

[3] Boston Med. and Surg. Jour., vol. lii. p. 254.

[4] Transactions of London Obstet. Society, vol. vi., 1865.

annoyance from local irritation."[1] In Parkman's unsuccessful case at the Massachusetts General Hospital, death occurred in twelve hours from contraction of the tissues inclosed in the ligatures and consequent hemorrhage, "although the ligatures were drawn as tightly as could be done by a strong man."[2]

It is futile to rely upon ligatures merely, whether passed through or merely around the pedicle, or to attempt to prevent hemorrhage, as Baker Brown has proposed since his late failure, and as has been done by others, by dividing the tissues by the actual cautery, which by causing a slough would only predispose to secondary hemorrhage or to peritonitis. The ecraseur enables us to avoid these risks, and to drop the pedicle, whether ovarian or uterine, back into its natural position in the cavity of the pelvis. In this manner we do not require the prolonged use of a clamp, so difficult often to apply, and by its traction almost insuring severe pain and excessive inflammatory action.

12. In extirpating the uterus, should the ovaries be also removed, provided they are healthy? I believe that it is better that they should. In two of Burnham's cases the ovaries are said to have been left; one of these women recovered, the other died. In Clay's successful case, but one of the ovaries is reported to have been removed. It is difficult to explain how this can have been done compatibly with the removal of the greater part of the uterus, without destroying so much of the remaining organic attachments of the ovaries as to cause their death, unless indeed adhesions had been previously formed between themselves and contiguous tissues. In some instances it would be impossible to operate without removing all the uterine appendages. In others, their being allowed to remain, supposing them to preserve their normal activity, might subject the patient till the time of the climacteric to all the annoyance of the menstrual molimen, without the relief to the disordered circulation afforded by the normal discharge.

I find that Koeberlé, in a recent publication, expresses a similar opinion:—

"The extirpation of the ovaries," he says, "which had already been rendered useless by the existence of the large fibroid, which necessarily prevented the normal evolution of pregnancy, has relieved the patient of her menstrual periods, and of all the inconveniences connected with them, as well as from the diseases which spring from the ovaries themselves."[3]

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[1] Boston Med. and Surg. Jour., vol. lii. p. 253.

[2] Lyman, Non-Malignant Diseases of the Uterus, p. 75.

[3] De l'Ovariotomie, Paris, 1865, p. 92. The above statements are commented upon by a reviewer in the *Med. Times and Gazette*, for Feb. 1865, p. 209. "As these arguments," says the anonymous writer alluded to, "apply with equal force to the healthy female, we can only conclude that M. Koeberlé regards the whole sexual organization of the female as a mistake and a nuisance, which is to be removed at the earliest opportunity." Need I state that such criticism is as un-

13. In this operation, of all others, haste should be avoided. As many of the unsuccessful cases have perished from concealed hemorrhage, from vessels that at the time of the operation received or seemed to deserve no attention, as from a truly secondary flow in consequence of the slipping of a ligature or of an ulcerative opening of the vascular canals. I have already mentioned the methods by which these latter dangers can be prevented. In the present instance it was nearly, if not quite, three hours before the external wound was finally closed. After nearly a dozen large vessels had been closed by metallic ligatures, which it is my intention shall remain indefinitely in their present bed, and perhaps twice as many more had been secured by torsion, there remained a general sanguineous oozing from the sites of adhesion and the stump of the uterus, sufficient for a while rapidly to fill the cavity of the pelvis. This was finally overcome, so far as we could judge, by mere exposure of the wounded surfaces to the air. Theoretically, this course should have killed the patient; practically she had never a bad symptom.

14. The method of closing the wound is of no small value. I believe in metallic sutures, passed through the peritoneal membrane, by which means exact apposition can be secured; and by having no ligatures to bring through the wound, themselves a source of irritation, to serve as a track for pus, we also insure thorough closure. In the present case, I had complete union by first intention during the whole length of the wound; in this operation as elsewhere, of the greatest importance.

15. Of the dressings of the wound, I have also a word to say. I used *none*. There was not even a strip of sticking plaster between the deep sutures, nor a single superficial suture of any kind. There was not even a wet compress. The bed-clothes were kept away by a suitable wooden frame, and till some time after the sutures were removed, which was on the thirteenth and fourteenth days, nothing whatever was allowed to touch the abdomen of the patient.[1]

16. As in all surgery, everything depends upon the after-treatment. I believe in a full diet, as free as can be borne; and while we are governed in a measure by the state of the pulse, we can govern the circulation itself and so in a measure prevent threatened inflammatory action, by arterial sedatives, as veratrum viride, whose importance in surgical practice has as yet hardly been appreciated. The less opium that is given the better. If the patient has been under proper prophylactic treatment, the bowels will probably not be irritable. The occurrence of irritability may be further guarded against by an astringent diet, as here, where the main dependence was at first upon boiled flour and milk; should disturb-

founded as it is discourteous and illiberal, and yet by just such objections is it that the advance of medicine and surgery is often sought to be stayed.

[1] See Local Requisites for the Primary Union of Wounds. Simpson's Acupressure, p. 116.

ance take place, an opiate by rectum is far better than the same by mouth, and produces much less constitutional depression. The first attempt at a fecal discharge, even by enema, and the first recurrence of the time for the usual menstrual molimen, are of all others seasons for especial anxiety. These passed safely, and the patient will probably do well.

The operation, when successful, effects a radical cure. Kimball's case, operated upon more than ten years ago, is now, November 17, 1865, "in the enjoyment of perfect health, having been so ever since her recovery." Burnham's first patient, also dating from more than ten years, "continued well four years after the operation, since which time she has been lost sight of;" his second case "remains well at present," October 9, 1865, over a year. Clay's patient, nearly three years after, "is now, October 17, 1865, in excellent health."

In none of the successful cases on record did there exist such apparently insuperable objections to the performance of the operation as in that now reported, from the enormous size of the tumour, and the extent and great vascularity of the pelvic adhesions. In none was convalescence so rapid, in none such perfect immunity from the slightest interruption to its progress. The case goes upon record as evidence of the most positive character, of the truth of Prof. Simpson's views, laid down in his work upon acupressure, as to the local and general requisites for the primary union of wounds and the diminution of the present high mortality from surgical operations.

In conclusion, I shall best serve my friends in this department of practice if I now express my creed, as to abdominal sections, in a few succinct general formulæ.

1. Almost all ovarian tumours, a far greater majority than has been generally supposed, may be safely removed by abdominal section.

2. A certain proportion, as yet not ascertained, of uterine tumours, fibroid or fibro-cystic, may be safely removed in a similar manner.

3. A large proportion of the fatal instances of either operation referred to, may be traced to neglect of simple precautions, prophylactic, immediate or subsequent.

4. Others still, to the fact that the patient was allowed to linger without assistance, till she was already practically moribund, before the commencement of the operation; and

5. Still others, that the surgeon's heart failed him after the abdomen had been opened, and the operation was not completed.

I would not willingly be thought one of those "rash, inconsistent, or thoughtless partisans," by whom, it is Spencer Wells' opinion that abdominal sections may be brought into discredit. I have been compelled to see that the condemnations of uterine extirpation by abdominal section have been no more decided than those pronounced against ovariotomy

but a few years since,[1] and that operation has now become of very common occurrence; that the mortality of the earlier uterine extirpations was no greater than that in many isolated groups of the other operation; that a large proportion of the fatal cases might undoubtedly have recovered, had greater prophylactic and subsequent care been exercised; and that no less than four-sevenths of the later cases of the operation have been crowned with success. It is evident from these facts that the operation now described ought *a priori* to be viewed more kindly than were the first ovarian extirpations. In skilful hands, it is not impossible that it may yet attain as great and as deserved renown. In no department of surgery is the common proverb more constantly true, and I apply it to the life of an otherwise condemned patient, and not to the operator's reputation alone, "Nothing risked, nothing obtained." By leaving the case to nature, we must yield our patient to certain, and often to speedy death; by operating, on the contrary, we may lift her from the grave into which she is already descending, and insure for her a long, comfortable, and perfectly healthy life.

"Your duty and mine," says West, "is not to sit down in apathetic indifference, doing nothing, trying nothing, for a patient's cure, because her disease is one which hitherto has proved almost invariably mortal; but rather, patiently, carefully, with much mistrust of our own powers, much watchful scrutiny of our own motives, to apply ourselves to the trial of every means by which suffering may be mitigated or life prolonged. To this our common humanity prompts, our obligations as medical men compel us. It is to misinterpret both very grievously, if we not merely content ourselves with doing nothing, but take shelter under noisy censure of the conduct and uncharitable construction of the motives of those who read their duty differently."[2]

ART. IX.—*Cases of Excision of Bones.* By JAMES B. CUTTER, M. D., of Newark, N. J. (With two wood-cuts.)

CASE I. *Removal of entire humerus and heads of ulna and radius.*—John E. F. Cleghorn, private 1st New Jersey Cavalry, was wounded in the left shoulder by a minié ball, November 27th, 1863, at the battle of "Mine Run," Va. The ball passed through the shoulder-joint, fracturing the *head* and *neck* of the os humeri, which was removed by Surgeon Clark on the field three days after the receipt of the injury. His incision, made with operation, was a longitudinal one, carried down in front of the deltoid

[1] For instance: "An unbiassed and calm review of all these points cannot fail to satisfy every one but those who take this means of bringing themselves into notoriety, that the abdominal section, for the removal of *ovarian* tumours, is uncalled for, is a useless sacrifice of human life, and never can become one of the legitimate operations of surgery."—*Edinburgh Medical and Surgical Journal*, April, 1844, p. 471.

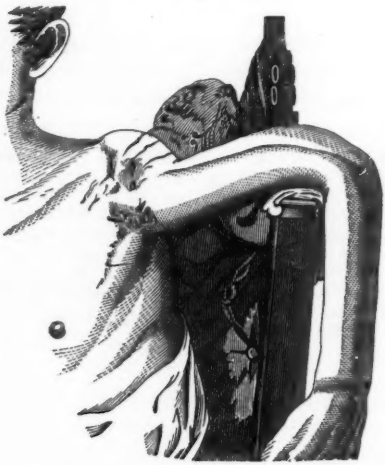
[2] Diseases of Women, p. 419.

muscle through the biceps sufficiently for the removal of about three inches of the shaft of the bone.

The patient states that about ten days after the operation an abscess formed at the elbow-joint, which was opened, and gave exit to a large quantity of pus. This opening existed when the patient was admitted into the "Ward" General Hospital, Newark, New Jersey, April 29th, 1864. There were other openings in the arm through which the probe would readily pass, revealing extensive necrosis of the entire shaft of bone and elbow-joint.

July 21, 1864. Operated for the removal of entire bone, including the heads of ulna and radius. Continued the incision made in the first operation, down the ulna line of the arm to the forearm; removed the bone with

Fig. 1.



very little injury to the surrounding parts. No ligatures were required, as the bleeding was completely arrested by the use of cold water. It is proper to state that the tubercle of the radius was left, leaving the insertion of the biceps muscle. The lips of the wound were brought together with silver sutures and adhesive plaster, and comfortably supported at a right angle with splints.

We succeeded in getting union by first intention almost throughout the entire length of incision. Three weeks after operation wound healed completely, and patient moving about.

The carpal, metacarpal, and digital muscles were left powerfully subservient to the will for grasping, holding, and pulling, though there is some paresis of the extensor-carpi digitorum. The arm, forearm, and hand are daily regaining a healthy tone; biceps and deltoid muscles contract strongly, zigzag for lack of fixedness; the entire arm and hand are somewhat atrophied. The arm is shortened one and a half inch, is extremely flexile and ungovernable.

Three months after the last operation the patient was presented to Dr.

E. D. Hudson, of New York City, with an order from the Surgeon General to have an apparatus made and applied. The following is the description of the appliance given me by the doctor:—

Fig. 2.

1st. A scapular piece fitted over the shoulder, with an artificial acromion process for a *point d'appui*.

2d. A somewhat spiral humeral case of wood and leather, to fit and encircle the whole arm snugly, to keep the muscles in place, and supply fixedness.

3d. An arthrodial joint (oscillatory), to unite the humeral and scapular parts, and extend the arm from the body.

4th. An aponuerotic case for the forearm, extending to the carpal end, to compact and prevent displacement of muscles in flexing.

5th. Ginglymus elbow-joints uniting the humeral and cubital case with greaves; stanchion appendid for tendons.

6th. Representative pectoral and brachial adductors and flexors of rubber webbing attached to the tendons, to draw the arm forward over the chest, and flex the forearm.

7th. Temporary representative extensor carpi digitorum, to antagonize the flexors of the wrist, hand, and fingers, to restore the tone of the extensors.

Incipient result of treatment.—Arm and forearm supported, strong, and reliable; arm oscillates at the shoulder; forearm flexes at will, at a right angle with the arm; holds parcels in his hands, lifts a pail of water perpendicularly, pulls strongly on a horizontal line. With practice will regain a highly commendable and gratifying use of his arm and hand, and

demonstrate the exceeding utility and propriety of the extreme exsection as a beneficial alternative for an amputation.

Dr. Hudson writes under date of November 27, 1865, that he has "since improved and reapplied this apparatus, omitting the waistband, and substituting an elastic strap across the chest from the shoulder pad to a soft pad passing beneath the axilla of the opposite arm; further than that, the general principles remain the same; and he is improving in the use of his arm. He was in here a few days ago, took an arm-chair and swung it around at an elevation of 45°—almost at a right angle with the body. Drs. F. H. Hamilton and Teats were in, saw the case, and were highly interested and gratified with the operation and results.

CASE II. *Removal of six inches of tibia, with the formation of new bone.*—Wm. H. Marston, private, Company "B," 17th Michigan Volunteers, age 23 years, of feeble constitution, was admitted to the "Ward" U. S. General Hospital, Newark, New Jersey, August 18th, 1864, from Washington, D. C., having received a severe gunshot wound of right leg, before Petersburg, Va., June 17th, 1864. A rifle ball (supposed by the patient to be an explosive one) struck the tibia anteriorly just below its tubercle, *drilling* the bone in its passage, then emerged posteriorly, just below the head of fibula, and behind that bone the tibia was not fractured, but, as I stated above, was *completely drilled*, the opening being large enough to readily pass the index finger.

The patient, when admitted into the "Ward" Hospital, had an extensive granulating wound, extending from the tubercle of the tibia to within three inches of ankle-joint, and three inches in width at its widest point; granulations flabby; discharge purulent and very abundant; four inches of the tibia uncovered, and protruding from the granulations, the bone was darkened in colour, and presented the worm-eaten appearance. This extensive wound was the result of hospital gangrene which the patient suffered while at the Finley Hospital, in Washington.

The general condition of the patient, at the time he was admitted into the "Ward Hospital," was anything but desirable: appetite very much impaired, reduced in strength by the profuse discharge from wound, and night-sweats which had existed for some time.

The patient was permitted by the surgeon in charge, Dr. George Taylor, Surgeon U. S. Army, to go into the country, some six miles distant, to reside with some relatives, where he could have the benefit of fresh air, good diet, and attendants, and be relieved from the confinement, noise, and confusion which always exist in a large ward in a hospital of this kind.

Treatment, stimulating and sustaining throughout.

October 1. Patient has gained greatly in strength in the last few months; the large sequestrum of bone being loose, it was thought advisable, considering the excellent condition of the patient to operate at once; accordingly preparations were made, and at 3 P. M., assisted by my much esteemed friend, Dr. Wm. S. Ward, the patient was put upon the operating table, and placed under the influence of chloroform and ether, and the operation commenced. An incision was made from the tubercle of the tibia, extending down to within two inches of the ankle-joint.

To remove this large sequestrum of bone (which measured six inches in length, the size of the entire tibia), it became necessary to cut through the involucrum at two points, the inner surface of this thin shell of bone was then thoroughly scraped, the wound cleansed, and its lips brought together

by three wide strips of adhesive plaster which encircled the whole leg; dry lint and bandages constituted the dressing.

It should be remarked that the hemorrhage during the operation was very abundant, so much so as to require the application of the tourniquet, no ligatures were necessary, however, as the use of cold water succeeded in arresting the hemorrhage completely.

The recovery of the patient was complete though tedious.

September 1, 1865. The patient has been discharged the service, and came to my office this morning for the purpose of having a photograph taken of his sound and useful leg. Stated to me that a few days since he walked six miles upon this foot without the use of crutch or cane, and considers it full as useful as its neighbour.

ART. X.—*Amputation of Right Shoulder-Joint.* By W. P. MOON, M. D., late Executive Officer of Mower U. S. A. Hospital, Chestnut Hill, Pa.

THIS case is presented, on account of the form of incision differing from any laid down in the works on surgery, with the hope that it may be of interest to the profession, and may prove of service to any one who might happen to have an injury of the same character to treat.

It has been seen and admired by several surgeons, among them Dr. Stephen Smith, of New York. I believe it has advantages over some operations, owing to the division of less muscular tissue, thus giving less surface to heal, consequently requiring a shorter time to effect a cure, and leaving greater rotundity and beauty to the shoulder:—

Samuel Irwin, Corporal Co. I, Sixty-seventh Pennsylvania Volunteers, aged 23, sound health and temperate habits, was admitted to Mower U. S. A. Hospital, September 24th, 1864, for gunshot wound of right shoulder, received at Winchester, Va., September 22d, by conical ball. Bullet entered at anterior border of deltoid muscle, four inches below acromion, injuring but not fracturing the humerus, and emerged one inch anterior to axillary border of right scapula. To all appearances the injury to the bone was only a slight contusion, but subsequent results demonstrate what serious consequences may follow mere contusions of the long bones of the body as well as similar injuries to the bones of the head.

The case did well under simple dressings until Oct. 15th, when sloughing of anterior wound supervened, which was treated with bromine, followed by a solution of permanganate of potash, x grs. to aquæ, ℥j. Extra diet, milk punch and beef essence were administered.

October 28. Hemorrhage occurred from anterior circumflex artery, which was ligated.

November 2. Ligature separated, and was removed.

December 6. Abscesses were discovered, forming about the middle third of the arm, and a free incision was made to relieve the parts of pus. The humerus was found to be denuded of periosteum to a large extent. The patient failed rapidly, and it was feared he would succumb under the

exhausting effects of the drain upon the system. Quinine and iron were added to the treatment, also a pint of pure cream to daily diet.

12*th.* Quite improved, appetite increasing, and general health better, although extensive necrosis is going on, involving nearly the entire shaft of the humerus.

January 2, 1865. Improving, but necrosis still going on.

9*th.* Sloughing occurring, a consultation was held with the consulting surgeons Drs. D. Hayes Agnew and T. G. Morton, when it was decided to amputate as soon as the condition of the patient would warrant.

13*th.* I performed the operation, the patient being thoroughly chloroformed and placed in a chair, assisted by Drs. Morton, Sheppard, Fell, McGrath, and Hendrie, by making an incision from the acromion process down the anterior border of the deltoid five inches and a half in length, on the inner side of the cicatrix caused by the operation for ligating the anterior circumflex artery. Another incision was made on the outer side of this cicatrix for the purpose of removing all hardened tissue formed by it. A transverse incision, posteriorly, was then made through the deltoid down to the bone, after which the head of humerus was dissected, and the knife passed down behind the humerus close to the bone until it reached the transverse incision, where it was turned outward and a circular incision made of the remaining muscles. A few ounces of blood only were lost in the operation, the arteries being secured, after the first incision, by an assistant grasping them. The patient reacted very slowly, appearing for a time more dead than alive.

The after-treatment consisted in the application of *dry dressing* to the wound for the first five days, or until active inflammation had ceased and free suppuration set in, followed by a *very light* simple cerate dressing. All but an inch and a half of the lower or circular incision and one inch of the upper, just below the acromion, healed by the first intention.

No medicine was given during the remaining treatment. Cream and beef essence were allowed every two hours, and brandy every other hour, for five days, when tender solids began to be taken, in addition. From the day succeeding the operation the case went on rapidly to convalescence—patient walking about the hospital in *twelve* days, and on the twenty-first day he visited his family in this city, where he now resides. He wears an artificial arm which he can joint at the elbow by the action of shoulder, and is able to carry considerable loads with it.

The present appearance of the shoulder will be seen by the accompanying engraving taken from a photograph.

The humerus was necrosed entirely off at the olecranon fossa, below and about three inches from the head of the humerus above. An attempt was made by nature to repair this extensive destruction of bone tissue by throwing out new bone the entire length of the shaft.

ART. XI.—*A Peculiar Case of Hæmatocele.* By CHARLES M. ALLIN, M. D., Surgeon to the New York Hospital.

THE occurrence of hæmatocele, succeeding or combined with hydrocele, or resulting from the wounding of some vessel in the operation of tapping the tunica vaginalis, is not very unfrequent. Its spontaneous appearance and growth, however, are quite rare, and the additional distension of the sac *by air* has never, so far as I have been able to learn, been noticed. I have therefore considered that the following case, which presented itself during my recent term of attendance at the hospital, was worthy of record, though I regret that the final result was not so satisfactory as I had reason to expect. This result, however, is not fairly attributable to a cause necessarily connected with the disease or its treatment, as was clearly demonstrated at the post-mortem examination.

H. W., a German, 38 years of age, *a shoemaker*, was admitted into the hospital, August 15, 1865. He stated that, fifteen years ago, his scrotum upon the right side began to swell without any apparent cause. This enlargement continued, slowly but steadily, to be augmented until about six years since; from which time it remained stationary, at about the size of a large orange, until three weeks ago, when suddenly, and without either injury, unusual exertion, or other assignable cause, it became distended, in a single night, to the dimensions presented at his admission. There had never been any treatment employed from the beginning of the swelling. The tumour now very closely resembled, in size and form, a bullock's heart, with the apex below. Its dimensions, by measurement, were as follows:—Vertical and lateral circumference, 22 inches. Vertical and antero-posterior circumference, 18 inches. Horizontal circumference at base, 13½ inches. Horizontal circumference at junction of upper and middle third, 17 inches. Horizontal circumference at junction of lower and middle third, 13 inches.

The right testicle could not be distinctly recognized, and the dioptric test failed to elucidate its exact position or the nature of the tumour, there being only slight translucency, if any, at the apex, and absolutely none elsewhere throughout its extent. The tumour was very tense, elastic, and slightly tender; fluctuation was very indistinct; the superficial scrotal veins were enormously distended, and over the whole upper portion there was *very marked resonance on percussion*. There was no impulse felt when the patient coughed, though there was an unusual eminence along the course of the spermatic cord, fully up to the abdominal ring. The other testicle was normal in size and position, though crowded to the left by the immense development of the right half of the scrotum. The penis was reduced in external size to a mere knob upon the upper surface of the tumour. There was but little abnormal heat about the parts, and the patient only complained of the dragging weight of his huge scrotum.

On the 17th, for the purpose of exploration, I made a small incision in the scrotum, just below the middle of its anterior surface, and passed a medium size trocar and canula into the cavity of the sac. The latter proceeding was accomplished with some difficulty, owing to the great thickness and firmness of the walls of the sac. On withdrawing the trocar, there

passed through the canula a dark chocolate-coloured fluid of about the consistence of strong beef-tea. This was followed by a quantity of small fibrinous coagula, and a *copious discharge of air*. The discharge was not free, the canula being much obstructed by the flocculent masses, but by freeing the canula with a director, and by pressure, especially from above, a considerable quantity more of the same substance, and more air escaped. *Neither the fluid nor the gas was at all fetid.* There were evacuated at this operation about twelve ounces of fluid, reducing the tumour to about two-thirds of its former size. Its resonance, however, was persistent.

This explorative proceeding of course perfected the diagnosis of hæmatocele, though the extraordinary presence of so large a quantity of air in the cavity of the sac, and this air so free from odour, was to me a new feature, and one not easily explained.

On the 21st, the patient's general condition was about the same as before the puncture; but, a little circumscribed inflammation around the orifice where the trocar was introduced, and a slight discharge of pus presenting, with a probe-pointed bistoury I enlarged my former incision, and evacuated the entire contents of the sac, the quantity being from a pint to a pint and a half of fluid, and again a large amount of gas. The character of the fluid was similar in appearance to that which escaped at the first opening, except that there were at the bottom of the sac about two ounces of pus. The entire contents of the tumour were now, not as before inodorous, but very fetid. When emptied, the walls of the tunica vaginalis were found to be nearly an inch in thickness.

Upon consultation with my colleagues in the hospital, it was decided that the sac should be extirpated. Accordingly, the patient being etherized, I removed the entire contents of that side of the scrotum by the usual operation. All the tissues of the scrotum were very much thickened, especially the dartos. The vessels encountered were enlarged and bled quite freely, and the cremaster muscle was immensely hypertrophied, simulating a normal external oblique. A redundant portion of scrotum, which was largely infiltrated with serous fluid, was now cut off, and the wound closed except the inferior two inches.

The patient's condition was very good, and the appearance of the wound was very satisfactory, though there was some tenderness around and above the inguinal ring, until the fourth day after the operation. At this time, erysipelatous inflammation showed itself in the wound, became rapidly phlegmonous in its character, and extended upwards and outwards beyond the anterior superior spine of the ilium. Free suppuration followed, and though counter openings were made, the deep burrowing continued, and the patient gradually became more and more exhausted, and died Sept. 2d.

At the *post-mortem* examination, the suppuration was found to have extended in the course of the fibres of the obliquus externus, destroying that muscle throughout nearly its whole extent. The cartilage of the tenth rib was exposed, and below this point the only vestiges of the muscle were a few scattered fibres. Even the aponeurosis over the inferior third of the rectus abdominis was destroyed, together with some of the connective tissue between its fasciculi. The remains of the cord in the upper part of the scrotum were apparently sound; and, on opening the abdominal cavity this supposition was verified by finding the spermatic canal entirely closed at its exit, though there was an unusually large and patulous internal ring. The vas deferens was of normal size, pursuing its natural direction to the neck of the bladder, and there was not the slightest evidence of inflammation along its course or in any portion of the peritoneum.

ART. XII.—*Instruments for Facilitating Surgical Operations.* By D. PRINCE, M. D., of Jacksonville, Ill. (With two wood-cuts.)

Two things are most desirable for a surgeon: 1st. To possess the versatility and dexterity to perform operations with the smallest number of instruments and of the simplest construction; and 2d. Instruments of easy management, the use of which may shorten the duration of an operation, and diminish its danger.

This contribution is to the latter of these two ends.

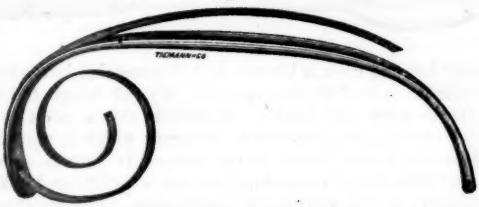
I. In an article upon exsections and amputations, in the number of this Journal for April, 1865, a *retractor* of simple construction is figured, the original design of which is attributed to Dr. C. A. Pope, of St. Louis.

By the aid of Mr. Stohlmann, of the firm of Tiemann & Co., N. Y., the instrument has been modified to answer several purposes, in addition to the one for which it was originally intended.

The first design of the *retractor* was to enable the operator to dispense with the use of the chain saw in exsections of the upper end of the humerus and some other bones, greatly shortening the time necessary for the operation; and in amputation of the humerus and femur, to enable the operator easily to saw the bone with a common saw, before cutting the posterior or inner flap containing the principal artery. By this proceeding, the operator is enabled to hold the artery between the thumb and fingers of his left hand while the final cut is made through the soft parts. The great vessel is thus exposed clearly to view, and can be immediately seized and tied. The necessity for a tourniquet, and for pressure upon the artery by the fingers anywhere in the proximal direction from the place of amputating, are both obviated.

As seen in the figure (Fig. 1), the instrument retains its former shape and function at one end. This curved probe, on the right of the figure, is

Fig. 1.



untempered, so as to be easily adapted to the encircling of bones of different diameters, in order to insinuate it between the bone and the soft parts; to be followed by the body of the instrument, which then effectually separates the bone from the uncut portion of the soft parts. Then, upon turning the instrument over, the groove, upon that aspect which is convex in the direction of its length, is brought next the bone, to receive the saw as it passes through the bone. The other end of the instrument is modified to serve three purposes.

First, it is flattened, in order that it may be a convenient *retractor* for holding aside the lips of any wound, in the progress of an operation.

Second, it has a thick edge, for the purpose of peeling up periosteum in amputations, exsections, or the destruction of portions of the provisional sheath over sequestra, in the perforations necessarily made through which to extract the fragments of dead bone. The instrument then performs the office of periosteotome. By preserving all the periosteum, in connection with the superimposed soft parts, the destruction of bone necessarily made, as steps in the operation, may be expected to be completely repaired. The body of the instrument makes a good handle for this *scraper*.

Third, a spring is adapted which may be employed to conduct a chain saw; whenever it may be desired to introduce it. The flat end of the instrument, armed with the *spring conductor*, is first passed under and around the bone or other part, when the spring is to be pushed along, until it can be seized by fingers or forceps. The chain saw, or a ligature, previously attached to the free end, can then be drawn along the groove in the body of the instrument, seized, and detached, after which, the retractor with its spring conductor, can be withdrawn together; or, as soon as the spring conductor is first seized, it can be held, while the retractor can be withdrawn, leaving the spring conductor in place; after which, the chain saw, or ligature, can be drawn into its position, by attaching it to either end of the spring conductor.

With such an instrument, put up in every amputating and exsecting case, it is believed, that it will be found to be a very important addition, to the surgeon's armamentarium.

II. It had often occurred to the writer, that the conveniencies and securities of the tenaculum and of the forceps, in seizing and holding arteries, should be combined, so as to make an instrument more convenient and more secure than either alone.

This *tenaculum forceps* (Fig. 2) is the realization of that desideratum. The instrument is represented as closed. It is first, a fenestrated forceps,

Fig. 2.

the upper blade turning upon a hinge which is concealed in the figure, by the slide in the central part of the instrument. By this hinge, the upper blade turns over, nearly upon the handle. It will do this as soon as the slide is drawn toward the handle, impelled by a spring which is concealed in the figure. When the upper blade of the forceps is turned over upon the handle, the instrument is a tenaculum, having a point or hook projecting from the extremity of the stationary lower blade. The instrument in this condition is applied to a bleeding artery like an ordinary tenaculum. The upper blade is then pushed down upon the lower, and retained by the slide. The instrument then acts the part of tenaculum and forceps combined, and the blades are made wide enough to stop the bleeding from any artery smaller than the upper femoral.

When the artery is secured by this instrument, the blood is arrested at the same time, so that it is a question of convenience whether the ligature or an acupressure needle shall be immediately applied. The compression of

a small vessel between the blades of the instrument for a little time, while the remainder of the operation is progressing, will often permanently arrest the hemorrhage. For the greatest convenience to this end, several instruments of the same kind should be at hand.

It will be observed, by looking at the figure, that the tenaculum point is protected by a guard, which gives two fenestræ to the upper blade. This is done for the convenience of applying a ligature. When the noose of the ligature is over the largest swell of the blades of the instrument, it is only necessary to draw upon it, and it slides to its position without any possibility of catching upon the point.

The writer has put the instrument to the test of several years' use with increasing appreciation of its value. There is but one drawback to the instrument. It is impossible to have it of such a size as to be a practical working instrument, and have a *pocket-case* instrument at the same time. As it exposes neither points nor corners, however, it may very conveniently be carried in one's pocket ready for use at any time.

ART. XIII.—*Reduction of an Inverted Uterus of Seven Months' Standing.* By THOMAS ADDIS EMMET, M. D., Surgeon to the State Woman's Hospital, New York. [Read before the New York Obstetrical Society, Nov. 21st, 1865.]

MRS. Q., aged 24, came under my charge Oct. 8, and presented the following history: She had menstruated for the first time at eleven years of age, with no return for a year, but after this period she became regular and continued in perfect health. She was married at 22 years of age; soon afterwards became pregnant and went to full term. Labour commenced between the hours of nine and ten P. M., March 11, 1865. She was attended by a homœopathic practitioner, who was called in attendance at once and remained all night. The progress of the labour, it seems, was perfectly natural. About eleven A. M., the attendant ruptured the membranes, and delivery took place of a large male an hour afterwards, labour having continued nearly thirteen hours. As the head passed the vulvæ, it was discovered that the umbilical cord had made several turns around the child's neck; the cord, as stated, was immediately slipped over the head without traction, the body followed immediately, and soon afterwards the placenta. Within an hour after delivery the patient suddenly became faint, with violent after-pains coming on. This condition continued for some forty-eight hours, with a bloody discharge, which, at the time of a pain, was expelled from the vagina with considerable force. After the pains had ceased, the discharge continued more than natural, and at times was almost pure blood About a week after delivery the nurse discovered a mass presenting just within the vagina. An examination was made by the attendant, a consultation called, and the case pronounced (as the patient states) one of cauliflower-growth. She returned home to her friends, in Utica, at the end of the month, still suffering from a constant sanguineous discharge. Her general health at length became so much impaired that Dr. McCall, of Utica, was consulted, and he recommended her to my care.

She presented every indication of suffering from extreme anæmia, with a pulse of 140, and a loud cardiac murmur following any exertion. On

making a vaginal examination, a soft mass, somewhat larger than an egg, was felt lying in the axis of the vagina, and, being pedunculated, might well have been mistaken for a polypus. I passed two fingers of the left hand well up into the cul-de-sac, behind the mass, so as to lift the uterus above the pubes, and, with the other hand over the abdomen, I was able to approximate the two sufficiently to satisfy myself that the case was one of inversion of the uterus.

Oct. 9. Dr. Thomas saw the case in consultation and verified my diagnosis. It was then decided that nothing could be gained by further delay.

10*th*. With a pulse of 160 per minute, she was placed under the influence of ether, at 12.30 P. M., by my assistant, Dr. Perry. As it was a serious question if, in her reduced condition, the anæsthetic could be continued long enough to effect the reduction, I requested Drs. Thomas, Sabine, and George T. Elliott to aid me with their counsel. After a few moments she was fully under the influence of the anæsthetic; the pulse became fuller and reduced in frequency. The patient was placed on the back, with her knees drawn up and lying on a table, of a convenient height for me to operate while seated. The left hand was passed entirely within the vagina, and by pressure of the fingers the fundus was dimpled, while the organ was steadied by the right hand over the abdomen. At the end of an hour I found that but little progress had been made beyond the fact that the fundus was somewhat smaller, in consequence of the impaired circulation from pressure. As there was full time for reflection, it became evident to me that the mode of reduction recommended by pressure made at the fundus was incorrect. As the fundus was indented by pressure, the body spread laterally, and, although it did materially dilate the neck by flattening it, the power was lost, without influencing to any extent the point of constriction. In fact it seemed if any force was exerted, it was to increase the difficulty by rolling in the parts above at the point of inversion. With this view I allowed the fundus to drop into the palm of my hand, and passing the thumb and fingers around the mass as high up as possible within the cervix, I made steady upward pressure with a view of returning first the portion last involved. This manœuvre was aided by lifting the organ above the pubes, and endeavouring with the other hand to roll out the inverted portion by sliding the abdominal wall over the point with some pressure. In the course of half an hour, the progress of the reduction was marked. The globular mass, which was felt through the abdominal parietes in the beginning, now gradually became oval laterally, with a marked depression in the centre. By this time my hand had become almost powerless, and I was obliged to call on Dr. Elliott to relieve me for a few moments. I then continued the manipulation for some three-quarters of an hour longer, when Dr. Thomas, who had been absent during the past hour, returned. From his appreciation of the progress made, the only fear I entertained of final success was in the patient's power of endurance. Gradually the fundus passed entirely within the cervix, but beyond this point, for an hour longer, but little advance was made in the reduction. The depression, however, felt through the abdominal walls, above the seat of inversion, had become large enough apparently to admit the extremities of three fingers, with a proportionate increase in the size of the mass. During the whole time the patient had been kept profoundly etherized by Dr. Perry. This was found necessary from the fact that in the beginning, when its influence was lessened to any degree, vomiting came on immediately, and with any movement of the patient it was impossible to steady the uterus or maintain the necessary

amount of pressure. Her pulse had continued good throughout, and her general appearance was satisfactory. Shortly before four o'clock she began to fail; at about ten minutes after that hour her condition had become critical, and I was obliged to abandon my efforts for the time being, in consequence of the powerless condition of my hands. In consultation, the opinion was unanimous that it would jeopardize the life of the patient to continue the etherization longer. In this opinion Dr. Echeverria, who was present, concurred. At my request a last effort was made, for I was satisfied that I could not be deceived in the fact that the depression, felt through the abdomen, was slowly becoming larger. Drs. Sabine and Elliot, after a few moments, desisted from their efforts, as the latter gentleman had advised a frequent change, so that the hand of each operator having rested, the power exerted would be maintained in a more uniform manner. Dr. Thomas in turn also passed his hand into the vagina, and, as he describes it, he drew down the mass so as to reproduce the inversion, and on immediately returning it, he found that it did so beyond its previous position; he repeated this manœuvre, and on returning it again, on the point of his finger (without force on his part, as he stated), the fundus passed on and the reduction was completed, after an effort of three hours and fifty-five minutes.

This point is one of great clinical interest, and worthy of discussion by the Society, as to the bearing of this manœuvre on the result, as well as the exact point at which it should be resorted to. My own impression is that Dr. Thomas is mistaken as to the extent of reduction made by him. The portion below the constriction was flaccid and could be readily drawn down, but above the engaging point, where the surfaces were forced into such close proximity, it is a question if more force would not have been required to reproduce the condition existing at the beginning, than it was possible to have exerted. The final effort, doubtless, hastened the issue, yet as the widest portion of the uterus was already so far advanced within the canal, it is possible that the muscular action of the organ itself might have at this stage soon completed the reduction, as, from the result, the canal was evidently already dilated sufficiently for the purpose. We see the principle demonstrated in an India-rubber ball which has been indented; as soon as the action of recovery has once commenced, the progress of restitution rapidly increases to the consummation.

She speedily recovered her consciousness after the ether, and during the vomiting following, as a precaution, I passed the index finger directly into the relaxed canal of the uterus, which was presenting immediately within the labiæ. It was fortunate that I did so, for on the instant I felt a portion of the posterior wall near the fundus indented. With the other hand on the abdomen, I seized the organ and restored the portion on the point of my finger, and retained it in the canal until the paroxysm had passed. It was the only effort at vomiting, and there was no return.

At 5 P. M., with a pulse of 130, twenty-five drops of Magendie's solution of morphia was administered with beef-tea by the mouth. At 9 P. M., pulse 128, as she was suffering from pain generally over the abdomen, thirty drops of Magendie's solution was repeated. She was sleeping quietly at 10.30 P. M.; pulse 112 per minute. At midnight the pulse was 108, and she had been sleeping since the last visit.

11*th*. At 9 A. M. the pulse was 110; she was free from pain, and had passed a quiet night. As there was some tenderness on pressure over the abdomen, a large poultice was ordered. At noon her condition was comfortable; pulse 120, with some increase of tenderness over the abdomen;

ordered the morphia to be repeated. Half past two P. M. was free from pain, and sleeping quietly; pulse 105. At 7 o'clock P. M. pulse the same; repeated the morphia.

12*th*. 9 A. M. pulse 100; she was entirely free from pain, and had passed a very comfortable night. From this time she was kept quiet in bed for twelve days without any further treatment being necessary.

16*th*. I made a digital examination and found the os patulous, but the uterine canal contracted above the vaginal junction so as to admit the point of the index finger only for a short distance. The sound passed a little over three inches readily to the fundus, with the organ somewhat anteverted.

Nov. 28. She visited me after taking a long drive. I found the uterus had returned nearly to its normal size. She had menstruated naturally a few days before, and was rapidly regaining her health and flesh.

After presenting the case to the Society, Dr. Budd remarked that Dr. Noeggerath had some years ago succeeded in reducing an inverted uterus by a similar process, and that the case was published in the Transactions of the Academy of Medicine.[1] Dr. Noeggerath being called on, related the case in full, and remarked that in recent cases, and where the fundus had not yet escaped from the cervix, the dimpling process recommended would sometimes succeed, but not always where the inversion was complete. He also gave the particulars of a subsequent case where he succeeded only by confining his manipulations entirely to the return of one side alone, until the reduction was complete. It was the opinion of some of the other members that the condition of the patient, at the point in question, favoured a rapid reduction in the last stage, and as the dilation was complete, the innate force of the organ itself might have soon completed the reduction.

[1] This paper was read before the Academy of Medicine, March 5, 1862, and published in the *Medical Times*, New York, April 26, 1862. Since reporting the case, I have read the article for the first time, and with great interest. But the method employed by myself was entirely different. I grasped the circumference of the mass as near the seat of inversion as possible, and, by upward pressure, the extremities of my fingers acted as a wedge laterally to roll out first the portion last inverted. And, in addition, the manœuvre was facilitated in a great degree by the action of the other hand over the abdomen.

Dr. Noeggerath's case was of thirteen years' standing. He first resorted to the method proposed by Prof. White, of Buffalo, but without success, and states in his paper as follows: "Almost discouraged by these fruitless efforts, and feeling that the strength of my right arm was nearly exhausted, I was about to desist from any further attempts, when the idea struck me to proceed on a different plan of manipulation. I at once changed the position of my hand in such a manner that the fore and middle fingers grasped the right section of the tumour; while the thumb was implanted on the left side at a point where the upper two-thirds of its length met the lower one. In this manner a pressure was exerted by the thumb on the lateral border of the body of the womb, which pressure took an upward as well as a lateral direction, and resulted in the formation of an oblong groove, the long diameter of which pointed below towards the left horn of the uterine fundus, and upwards to the spot where the inverted and the non-inverted portion met on the left side. The object of this first step of the operation was to completely double up the uterine cavity, so that the right—now inner—wall touched the left one. After this was completed, the dimpled portion was carried upwards by the thumb, and in doing so it could be observed that the right side of the upper section of the inverted cervix passed first of all through and beyond the os uteri. During the progress of this manipulation, the right lower section of the uterine body followed, and reassumed its normal position, while the opposite part of the fundus continued to remain outside the os, only much shortened and doubled up. As soon, however, as half of the tumour had disappeared inside the abdominal cavity, the intra-vaginal section slipped suddenly out of my fingers, and the operation was completed."

TRANSACTIONS OF SOCIETIES.

ART. XIV.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1865. *April 5. Mammary Cancer.*—Dr. JOHN ASHHURST, Jr., presented a specimen of cancer of the breast which he had removed from a patient in the Episcopal Hospital. She was a married woman, 62 years of age, and had suffered from the affection for which she was admitted for not less than 15 years. During the last 18 months her pain had been so acute and constant that she was exceedingly anxious for an operation, though fully understanding that the relief which it promised could in all probability be merely temporary. The tumour was seated in the upper part of the left mamma, involving a portion only of the gland, but extending into the neighbouring tissues, being adherent to the skin, and likewise to one of the costal cartilages and the adjacent intercostal muscles. Two glands in the axilla were much enlarged and indurated, and there were one or two tubercles detached from the principal mass and excessively tender to the touch. The most adherent portion of the tumour was ulcerated to the extent of about an inch square, and from this surface occasional hemorrhages took place. The patient was extremely feeble, and exhausted from pain and loss of sleep.

Ether having been freely administered, an incision was made of a somewhat oval form so as to include all of the diseased integument; it was afterwards found necessary to extend it considerably so as to remove the diseased axillary glands. The tumour was removed as much as possible by tearing instead of cutting, the healthy portion of the gland being, however, allowed to remain. Four ligatures were required; two of them to the cephalic vein, which was divided in removing the axillary glands. The edges of the wound were approximated without much difficulty by means of silver and lead wire sutures, and supported by broad strips of adhesive plaster. The patient reacted but slowly from the effects of the ether, and for a few days suffered a good deal from dyspnœa; a chronic catarrhal affection, under which she laboured, having been aggravated by the irritating vapour.

The incision rapidly healed, to a great extent by adhesion, and the patient's constitutional condition improved in an equally satisfactory manner.

About a week or ten days after her discharge from the hospital, however, she applied for readmission on account of agonizing pain in the right leg. It was now found that the tibia had become greatly enlarged, and acutely sensitive to the touch. She stated now, which she had never mentioned before, that some months previously she had struck her leg against the bedstead, and that she had had some pain in walking ever since, though she had paid but little attention to it till she had left the hospital, her mind being occupied by the condition of her breast. Malignant disease of

the tibia was diagnosticated, and, as it had advanced very rapidly during the preceding three or four days, she was advised to submit to an amputation as a means, if not of prolonging life, at least of alleviating her present suffering. She, however, positively refused the treatment proposed, and, of course, left the hospital.

The excised mammary tumour was microscopically examined by Dr. Packard, and found to present the usual multiform cells, some containing several nuclei, and many containing numerous nucleoli.

May 3. Dr. PACKARD made a verbal communication on the subject of Anæsthesia, as follows:—

My attention was attracted a few days since by an article, from the pen of Dr. Lente, of Cold Spring, N. Y., published in the last number of the *New York Medical Journal*, and entitled "Sulphuric Ether *versus* Chloroform." In that article Dr. L., who is well known as an advocate of the use of ether by his writings in various periodicals, says: "This fact I regard as settled—that a patient may be brought under the influence of sulphuric ether as quickly as he can safely by chloroform, and with a quantity costing less, and weighing but little more than the requisite amount of the latter; the objection, then, sometimes raised by army surgeons, of increased trouble of transportation, is not tenable.

"If any doubt this fact, after referring to the statistics above alluded to,[1] *I will agree to go to any hospital where a large number of operations are being performed, and demonstrate it to the satisfaction of the opponents of ether.* * * * *

"The recently published report of the Royal Medical and Chirurgical Society of London, adverse to the employment of sulphuric ether, and the recent occurrence of so many additional cases of death from chloroform poisoning, have forcibly recalled my attention to this subject, and, at the risk of a charge of egotism, induced me to make the offer which I here repeat; in other words, that is, to guarantee to get a number of patients, in any hospital, under full anæsthesia with sulphuric ether in as short a time as can safely be done with chloroform, and with a quantity not exceeding an average of two ounces and a half, the average time two minutes and a half. The average time and quantity would probably be less in the ordinary run of hospital cases (not more than half as much in cases of considerable debility, and after hemorrhage or insufficient nourishment, as in many cases in military surgery)."

Until the fall of 1864 I had been in the constant habit of administering chloroform for the purpose of inducing anæsthesia, and in hundreds of cases had never seen any injurious effect from it. My reason for preferring it to ether was the greater facility of carrying it, the very much smaller quantity required, and the more agreeable character of its influence. A case which occurred then, however (reported by me to the College, and published in the *American Journal* for January, 1865), in which death was imminent, and averted only by the prompt use of an electro-magnetic battery, shook my confidence; and it was shortly followed by another, in which death actually took place, at the Beverly U. S. A. Hospital.

Another case has very recently occurred to me, in private practice, in

[1] Given by Dr. Lente in the American Journal for April, 1861, in the American Medical Times, June 28, 1862, and in a Report of the Committee of the Boston Society for Medical Improvement, published in 1861.

which chloroform, given to a patient already nearly insensible from ether, was productive of alarming symptoms.

Dr. Lente's statements, as before quoted, led me to write to him to inquire as to the method of administering the ether, in order to obtain the effect in so short a time, and with so small a quantity of the article. His answer to my question is contained in the following extract from his letter:—

"All you want for the efficient administration of ether, after procuring a pure article (and Squibb's I prefer to any other), are stiff paper and a rather stiff and thick towel, if one can be had—if not, any will do. I usually take a newspaper—as that is to be had in every house—fold it, so as to make it about eighteen inches long and seven to eight broad; fold the towel so as to correspond, lay one on the other, fold them so as to form a cone, with the *towel inside*, and pin them securely, especially the edges of the towel inside, so that it will not fall on the face and annoy the patient. The apex of the cone must be folded tightly, so that *no air* can enter. If the cone is rather elongated, I stuff a white handkerchief tightly into it, so as not to have its capacity too great. You see the great object is to have the vapour *as concentrated as possible*, just the reverse of what is safe with the vapour of chloroform. The patient being all ready, I explain to him fully how to inhale the ether, and the unpleasant symptoms which he will probably experience at first, assuring him of the perfect safety of the process (which cannot be done in the case of chloroform). I then have some one take hold of his hands quietly, so as to be ready to arrest any sudden movement towards tearing away the inhaler from the face, and other assistants to look out for other violent movements, so that the process, when once commenced, shall not be interrupted for a moment. I then pour on, from a three or four ounce bottle, with not too narrow a mouth, about a drachm or two of ether (if I am anxious to use as little as possible), if not a little more, until I ascertain the capacity of the patient for breathing it; if he does not cough or strangle, I put it in close contact, taking care always not to press in the sides of the cone, so as to encroach on its capacity, holding it with *both hands*, near its edges, and pressing them pretty firmly, at all points, against the face. If he persistently hold his breath, as patients occasionally do, or strangle in any considerable degree, I remove it *slightly* from the face for a moment. In a very short time, I throw on an ounce more of ether, and then keep the inhaler in close contact with the face; this is repeated, scarcely ever using more than three or four drachms at each fresh application, until the etherization is effected. A very important point, and one most generally neglected, is to keep the inhaler away as short a time as possible when replenishing the ether, *throwing it on*, and not deliberately pouring it on, as I usually see done. As long as the patient retains consciousness, if he does not follow my directions with regard to full and rapid inspirations, I now and then call loudly, in his ear, *breathe strongly!* No matter how hard his struggles are, after he has commenced to breathe fully, I never 'let up,' but keep the cone remorselessly pressed against his face, and ply him still more strongly with the ether. This must be especially attended to in the case of all children, for with them it is generally a struggle from the beginning, whether ether or chloroform be used, and it is neither necessary nor practicable to get their confidence so as to ease them with the inhalation, as I have described above in the case of adults. Their cries and consequent full inspirations cause them to succumb very rapidly.

"By following these directions you will, after a little practice, etherize your patients as quickly and with as little trouble as you can safely chloroformize them—that is, in from three to four minutes (average), and with from one and a half to two and a half ounces of ether. But if you choose to use from *two to three* ounces of the drug—and more than the latter is almost never necessary—you may shorten the time by a minute. I speak of comparatively robust adult subjects; with feebler, less time and less ether are required. It is better to have no current of air about the patient during the process, if possible. It is important to be fully impressed with the fact that there is absolutely no danger

of death from *too sudden action* of the ether, otherwise we will not give it with sufficient confidence to insure a prompt result. The little danger attaching to ether is from *prostration*, which always occurs after the operation is over, and the patient has recovered his consciousness. I have, in several communications, insisted that the pulse should be watched for a time after the administration of ether, especially in delicate subjects, or if there are any indications of extreme debility. I have had, and have published several cases of severe prostration succeeding etherization, but I have never seen any case where I could get a patient too suddenly under the effect of sulphuric ether. It is not surprising that when the manner of administering the two agents is so entirely different, those who have generally been in the habit of using one, should fail when attempting to employ the other, until they have become thoroughly accustomed to it. I gave ether a short time ago to myself, in the hospital at West Point, unassisted, and became completely insensible with half an ounce, so as to be unconscious of the extraction of a molar tooth by the hospital steward, Mr. Saunders. A few days after, with a four ounce bottle of ether, I etherized three patients, from whose jaws the steward extracted at least forty teeth in the aggregate, and used only about three-fourths of the contents of the bottle. As regards the *nausea* and *vomiting*, referred to in your letter, if no food be taken for four or six hours before the operation, there is seldom any trouble worth mentioning. It is usually well to give a little brandy and water or a glass of wine before the operation, especially if the subject be feeble. And in case of severe operations, if much prostration supervenes, I give an enema of brandy and water. I have thought for some time of having an inhaler constructed of silver wire network, with a cone of woollen over it, and some impervious material over that, as suggested by my friend Prof. T. G. Thomas, but I succeed so well with the extemporized apparatus above described, that I have not yet had it done."

I have not yet had an opportunity of trying this method of administering ether, but, from what I know of Dr. Lente, I am inclined to place great confidence in what he says. It is very doubtful whether we ever obtain any other anæsthetic agent at once so safe and so efficient as sulphuric ether; we certainly have not found any such as yet. If, therefore, we can improve upon the methods now generally in vogue for its administration, we shall do well to prefer it to its more dangerous rivals.

July 5. *Report on Meteorology and Epidemics for the year ending Jan. 1st*, 1865. Dr. JAMES M. CORSE presented a report, of which the following is an abstract:—

The meteorology of Philadelphia for the past year has not been marked by any striking variations from the usual phenomena. The temperature has departed from that of the preceding year by only a slight variation.

The following table will give the maximum, minimum, and mean temperature, monthly, for the year 1864:—

	Maximum.	Minimum.	Mean Temp.
January	64.	9.50	33.28
February	58.	5.	35.97
March	58.	22.	40.50
April	75.50	34.50	50.58
May	85.50	44.	67.20
June	99.	65.50	72.
July	93.50	77.	76.08
August	96.	73.	79.40
September	80.	50.	65.
October	76.50	39.	54.75
November	69.50	25.	45.80
December	60.	12.	36.77

The mean temperature for the year was 54.77° Fahrenheit.

Rain and Snow.—The fall of rain and snow during the year 1864 has been a little more than three inches less than the year 1863.

The following table will give the monthly distribution of the rain and snow for the last three years:—

	1864. Inches.	1863. Inches.	1862. Inches.
January	1.705	4.720	4.795
February	.551	4.680	4.640
March	5.170	5.885	3.553
April	3.795	7.015	4.160
May	8.685	4.510	2.308
June	2.345	4.250	6.975
July	3.770	6.009	2.462
August	1.920	1.447	4.925
September	7.165	0.875	2.980
October	1.820	2.465	4.770
November	3.930	2.700	4.740
December	5.145	4.633	1.650
	46.001	49.189	45.008

Epidemics.—On this subject we can have but little to say for the year 1864. The good climate and favourable hygienic circumstances of Philadelphia exempt us, in a great degree, from epidemics at all times, and when they do prevail it is not common for them to be violent in their effect, or of long duration. Of epidemics not enough is known to enable us to speak with precision, and without occupying your time with speculations upon the cause of them, upon the nature and mode of operation of the morbific agent, or what forms the constitution of the atmosphere within any given period or season, we may say, with propriety, we think, that the epidemic constitution of the atmosphere in the first quarter of the year was such as to incline all diseases to a low grade of action corresponding to the fourth epidemic constitution of Hippocrates. It improved a little for the second and third quarters, but was again very strong in the fourth quarter. The first and second quarters were very damp, with prevalence of febrile diseases, corresponding to the autumnal constitution of Sydenham, this constitution was much more strongly marked towards the close of the year. It will be remembered that the winter of 1863–64 was mild, so much so that we failed to get a supply of ice for summer use; the spring was cold, wet, and late, and we noticed that the growth of cryptogamous plants was more luxuriant than usual; the northern exposure of walls, and the bark on the north side of trees were covered, near the ground, with mono-cellular algæ, particularly the chlorosporeæ; fungi, lichens, and mosses were also more abundant than usual.

These facts, and others of a similar kind, would allow us to suppose that other and lower forms of vegetable growth were produced in greater abundance than usual, and help to sustain those hypotheses which attribute epidemic diseases to a vegetable origin.

The same facts may also be used by those who suppose epidemics to have an animalcular origin, for many species of the well-known lower forms of life are classified by zoologists among animals, while botanists claim them for the vegetable kingdom.

No disease has prevailed in Philadelphia during the year 1864 to which the term epidemic could be properly applied.

A quasi-epidemic has prevailed to which some give the name of spotted

fever, others cerebro-spinal meningitis, others, again, malignant fever, etc. etc.; it seems to be a disease with diverse symptoms, all of an adynamic character, which are best treated by tonics, stimulants, and nourishing food.

Under the head of spotted fever 240 deaths have been reported to the Board of Health for the year 1864; 49 for 1863, and none previously.

Typhus has prevailed to a considerable extent, but it can hardly be called epidemic; yet there has been a gradual increase for the last three years, as the following statement will show:—

Deaths from Typhus.

1862.	1863.	1864.
37	131	335

In 1864 the deaths were, quarterly, as follows:—

1st Quarter.	2d Quarter.	3d Quarter.	4th Quarter.
168	70	45	52

The disease made its appearance in the female department of the County Prison in November, but was, by the timely, judicious and energetic measures, arrested without a death, after attacking 15 prisoners, two convicts, and five untried, and many of the officers of the Institution.

The whole number of deaths in Philadelphia for the year 1864 is 17,582. This includes the entire city in its present extended limits.

This number is 1,794 greater than that for 1863. The causes for these deaths, registered at the Health Office, amount to 275 in number. A very large majority, however, were occasioned by comparatively few causes. Consumption of the lungs alone having occasioned 2,089.

Subjoined is a table of 36 causes, which account for 14,607 deaths, leaving only 2,975, for which a long list of causes are assigned.

The following table presents a carefully compiled list of deaths, showing the comparative mortality from their causes for the last four years.

Causes.	1864.	1863.	1862.	1861.
Apoplexy	181	194	176	162
Casualties	178	120	135	122
Convulsions	736	681	703	630
Croup	455	444	258	304
Congestion of the brain	440	421	324	275
" " lungs	172	183	147	110
Consumption of the lungs	2,089	1,955	1,949	1,817
Cancer	180	140	181	189
Cholera infantum	641	930	622	611
Diphtheria	357	434	325	502
Dropsy	224	225	236	284
" of the brain	218	225	200	202
Disease of the heart	345	305	242	260
" " brain	99	103	98	112
Diarrhœa	454	315	417	183
Debility	756	926	940	826
Dysentery	249	176	163	157
Drowned	133	131	135	99
Fever, scarlet	349	275	461	1,190
" typhoid	648	486	654	281
" typhus	335	131	37	45
" spotted	240	49	...	...
Gunshot wounds	366	310	292	20
Hooping-cough	87	78	208	93
Inflammation of brain	440	386	365	305
" " bronchi	185	122	116	138
" " lungs	929	743	749	681
" " stomach and bowels	289	267	306	231
Inanition	219	129	125	124
Marasmus	598	606	643	533
Measles	90	82	109	74
Old age	278	234	219	203
Palsy	172	201	164	159
Smallpox	260	171	264	758
Stillborn	788	743	711	630
Unknown	427	112	97	104
	14,607	12,815	12,771	12,458

The aggregate monthly mortality is exhibited in the following table, which is interesting as showing the effect of vicissitudes of the weather on the general health of the whole population :—

January	1,302	August	1,956
February	1,434	September	1,251
March	1,894	October	1,144
April	1,377	November	1,212
May	1,529	December	1,595
June	1,245		
July	1,643		17,582

The following table of deaths of soldiers, in military hospitals, amounting to 1,598, is very interesting in showing what sort of diseases are engendered or aggravated by camp life :—

Interments of Soldiers.

Albuminuria	1	Fever, congestive	2
Asthma	1	" camp	1
Abscess	3	" nervous	1
Accidents	22	" malignant	1
Asphyxia	1	" spotted	4
Aneurism of the aorta	1	Fatty degeneration of heart	2
Apoplexy	6	Fracture of skull	1
Anemia	1	" of thigh	5
Amputation	1	Gangrene	8
Cancer	1	Hemorrhage	20
" of the stomach	2	" from bowels	2
Cholera	1	" from lungs	4
" morbus	1	Hernia	1
Congestion of the brain	12	Inflammation of lungs	135
" " liver	1	" of brain	17
" " lungs	7	" of bronchi	12
Coup de soleil	2	" of heart	2
Croup	2	" of peritoneum	6
Consumption of lungs	122	" of stomach and bowels	18
Cerebro-spinal meningitis	6	" of larynx	1
Convulsions	2	" of tonsils	1
Concussion of the brain	1	" of pleura	12
Compression of the brain	6	" of veins	2
Dropsy	7	" of liver	3
" of the chest	1	" of spine	1
" of heart	3	Inanition	66
" of lungs	1	Insanity	2
Disease of stomach and bowels	1	Jaundice	3
Disease of brain	1	Murder	4
" of kidneys	2	Measles	6
" of heart	10	Mania-a-potu	16
" of liver	1	Mumps	1
Drowned	6	Marasmus	2
Diarrhœa	214	Ossification of heart	1
Dysentery	22	Palsy	3
Debility	22	Pyemia	59
Diphtheria	15	Rheumatism	3
Erysipelas	15	" of the heart	2
Enlargement of heart	1	Suicide	1
Epilepsy	6	Softening of brain	2
Empyema	4	Scrofula	1
Exposure	1	Shock	1
Fever, typhoid	183	Smallpox	19
" lung	1	Sore throat	1
" typhus	12	Syncope	1
" intermittent	2	Tetanus	7
" bilious	1	Unknown	33
" remittent	1	Ulcers	1
" traumatic	1	Ulceration of stomach	2
" yellow	1	Wounds, gunshot	355
" hectic	1		
" scarlet	4	Total	1,598
" catarrhal	1		

Oct. 4. *Cancer of the Ascending Colon.* Dr. ALFRED STILLE reported the following case of this :—

In April, 1864, I was asked to see Mr. X. He was 52 years of age, had been for twenty years or more a bank clerk, and in his habits was most methodical and exemplary. His constitution was naturally somewhat delicate, and his person slender; his complexion was clear, and neither pale nor

florid. His father died of stone in the bladder; and a sister, and, if my memory serves me, his mother also, of cancer. Since childhood he had been subject to attacks of diarrhœa, apparently from food disagreeing with him; but his appetite and gastric digestion had always been excellent. He had never suffered any serious attack of acute disease. During the last ten years he had been subject to neuralgia of the left sciatic and crural nerves, which was much relieved by the interrupted galvanic current.

In 1861 he experienced a severe attack of diarrhœa, and afterwards continued to be more liable to it than previously; for the last few months before my visit the stools had been very frequent, and his flesh and strength declined. I found him pale and thin; his pulse 65, and feeble; without cough or heart symptoms; his appetite and digestion good. The abdomen presented a natural aspect, and was everywhere indolent except between the umbilicus and the right flank, where, within a space of about two or three square inches, there was tenderness under pressure and a sensible hardness. Under the use of suppositories containing opium and strychnia the diarrhœa ceased, and a diet consisting exclusively of milk, cream, butter, farinaceous articles, and meat essence was strictly enjoined. The improvement was such that Mr. X. was shortly enabled to partially resume his duties at bank.

During May and June, 1864, however, a very steady but gradual loss of flesh occurred, and the complexion acquired a pale straw tint. The stools were usually of a natural colour, and consisted of small, hard, rounded masses, with more or less mucus, or else of narrow cylindrical pieces; but sometimes they were formed principally of mucus, and were voided with pain. There was a good deal of vesical irritation, requiring the patient to rise frequently at night. This symptom was relieved by lime-water. As the summer advanced, the tumour became more palpable, not so much on account of its own growth, as because the integuments grew thinner. Still, its mass was certainly greater, and estimated as measuring two by three inches in diameter. The least departure from the prescribed regimen, and especially the use of solid food, even in very small quantities, occasioned pain and tenderness in the tumour, and diarrhœa, which was usually checked by acetate of lead and opium. During July, on one occasion a small piece of rare beef was eaten for dinner; the same night severe pain was felt at the seat of the tumour, which was of an intermittent character, and the swelling itself largely increased. These symptoms were very severe for eighteen hours, when they suddenly ceased, and the tumour subsided to its ordinary dimensions. Two stools followed, which were of a natural consistence. About a week afterwards a similar attack occurred. On this occasion the abdomen was distended and resonant; and, although not tender, it was the seat of constantly recurring paroxysms of severe pain, extending throughout the belly, but most violent at the seat of the tumour. The pulse became thready, the extremities cool, the features pinched, and there was hiccup with occasional retching, and the rejection of a greenish liquid. Fomentations with spirit of turpentine and the administration of repeated doses of calomel, extract of hyoscyamus, and creasote allayed the vomiting, palliated the pain, and at last produced an alvine evacuation, and the complete subsidence of the abdominal distension, and of the pain. For several days afterwards the tumour swelled visibly and palpably if it was handled, causing at the same time a slight colicky pain.

From this time there was less suffering. In the month of August the feet began to swell; but the muscular strength improved as well as the

appetite, and the patient walked or rode out daily; and by the end of September had gained five pounds in weight. He resumed his duties at bank. At the end of October he had general but slight anasarca, which was most conspicuous in the feet. The urine contained no albumen, showed no sediment, was acid in its reaction, and had a sp. gr. of 1.018. In November a mild spontaneous diarrhœa caused the evacuation of nearly all the dropsical effusion, after which the strength improved so far that, although with some difficulty at first, the patient went to his office to transact important business. For three months afterwards he did not require any special attention, but continued to perform his duties, although he suffered inconvenience from the renewal of the dropsy, especially in his lower limbs.

I was called once more to visit him about the end of March, 1865, when the effusion was undergoing a rapid and spontaneous discharge by the kidneys, occasioning a good deal of prostration. There was no pain nor diarrhœa, and the appetite was good. The skin was paler, and the veins more pinkish; the urine normal. It may be mentioned here that the patient had all along been taking one or another preparation of iron; cinchona, usually in the form of tincture, and more or less wine or whiskey according to his appetite and strength. These tonics and stimulants now became more necessary, because his tissues were evidently wasting and his blood growing more watery. An additional proof of the last statement consists in the soft blowing murmur which now began to be heard in the heart, and in the great arteries of the neck, and which thenceforward grew louder and more shrill. Furthermore, hurried palpitation of the heart, with a sense of constriction at the præcordia, was induced by all muscular efforts and every lively emotion of the mind.

From this time a gradual and steady decline of flesh and strength took place, notwithstanding the appetite continued to be good, and food sufficient for normal nutrition was consumed. No striking change occurred in the size, relations, or sensibility of the tumour; the bowels were regularly moved, and the stools of good consistence and colour, were generally more or less scybalous. As the flesh and strength wasted, the pulse gradually became more frequent, rising from 72 very slowly until it reached 96 and upwards, and also grew faint and thready. Towards the close of July diarrhœa was renewed without pain or abdominal disturbance of any kind; the stools consisting of a yellowish, thin, gruel-like, and very fetid substance. Finally, life slowly departed without the slightest struggle, on the 9th of August.

I was permitted to make an examination of the body, of which I availed myself so far as to inspect the abdominal organs and to secure the diseased part, which is herewith presented.

There was a small quantity of clear liquid in the cavity of the abdomen; but no vascular injection, no adhesion, nor other sign of peritoneal inflammation. The caput coli, appendix cæci, and ileo-colic valve were perfectly healthy, and for two and a half inches above the valve there was no trace of disease. From that point, and upwards, for a distance of three or four inches, the calibre of the colon was very much narrowed, at one place to such a degree that the end of the little finger could scarcely be passed into it. The mucous membrane itself, except a slight superficial abrasion, the one-eighth of an inch in diameter, appeared to be perfectly sound. But the remaining coats, for about one-half or two-thirds of the circumference of the colon, were lost in a mass of scirrhous cancer in the first stage of

softening, and which became thicker towards the meso-colon, in which also the glands were enlarged and hard. No other secondary cancerous deposit was observed in the liver or elsewhere.

It is worthy of remark in this case that from first to last the cancer gave rise to no pain, except what was due to occasional obstruction of the bowels by solid food. It is also to be remarked that the appetite was always good, was often craving, and the patient's imagination dwelt willingly upon the good things he might eat and drink. Further, that in spite of a large quantity of food, especially of milk, bread, and other farinacea, with juice of beef, &c., emaciation was steadily progressive, and anæmia gradually, and at last in a remarkable degree established. This is the more noticeable when it is remembered that none of the organs concerned in primary absorption and assimilation were diseased, but only one whose chief office is excretory; and also that the loss of strength by diarrhœa or pain was very trifling. The case in question, then, may be regarded as tending to confirm the doctrine that the constitutional dyscrasia, much more than the local lesion, is the cause of decline and death in many cases of cancer.

My chief object, however, in presenting this case to the College is that its history and illustrative specimen may be preserved as an example of cancer in a very unusual situation. Cancer of the stomach, the rectum, the sigmoid flexure, the transverse colon, and the cæcum, are frequent in the order mentioned, but I have never seen an instance in which the ascending colon was the only part of the intestine involved, nor have I met with such an example on record. It appears to me that in this case the disease began in the meso-colon, and gradually embraced a portion of the intestine. This view is suggested by the greater thickness of the deposit in the meso-colon than elsewhere, the freedom from cancer of the colon opposite to its attachment, and the soundness of its mucous membrane in spite of so protracted a disease.

Regeneration of Bone.—Dr. HUNT reported that regeneration of the bone had taken place to a remarkable degree in the case of excision of the lower jaw for phosphorus-necrosis, in which the periosteum had been preserved, an account of which was published in the *American Journal* for April, 1865 (p. 353). The patient was introduced into the room, and examined with great interest by the Fellows of the College who were present.

Nov. 1. *Tumour on the Posterior Portion of the Tongue.* Dr. WM. HUNT reported the following case:—

Mary M., aged 16 years, was admitted into the Pennsylvania Hospital on account of a tumour situated on the posterior part of the tongue, and immediately in front of the epiglottis. The tumour was very large for the place that it occupied, and apparently completely filled the fauces, but on examination it was found that the neighbouring structures had accommodated themselves to its presence, for the velum could be readily raised from it, and the finger passed behind and around its posterior surface. The epiglottis could be felt also without difficulty, and, upon drawing the tongue forward and depressing it, the parts behind were seen to be entirely normal. All of the morbid growth could not be seen or felt, as it descended beyond the reach of the finger, and its size was not fully appreciated until it was operated upon. In every other respect the patient appeared to be perfectly healthy, and she applied for relief because the tumour was growing and becoming troublesome, interfering with speech and deglutition, and with respiration when in the recumbent position.

The history, as obtained from the patient, is as follows. Five years ago, during an epidemic of diphtheria, she felt some uneasiness in the throat. It was examined by a physician, and he then discovered a small tumour, about the size of a pea, on the middle of the posterior surface of the tongue. Nothing was done for it, and it continued to grow without giving rise to pain or even uneasiness, until it became nearly as large as when the patient was admitted into the hospital.

The surface of the tumour was very red, with large distended vessels coursing over it. There was no pulsation. It was quite elastic, and had an indistinct fluctuating character, but not decided enough to indicate fluid. The opinions as to its nature were various, but favoured the view that it was a hypertrophy of glandular tissue, and probably connected with the part known as the foramen cæcum, at the apex of the circumvallate papillæ.

An operation was decided upon, and it became quite a problem how to manage such an uncontrollable part. A peculiar tenaculum with a large curve was made, and into the shaft of this was fixed a sliding-piece of steel, with a catch to fit the point of the tenaculum. The object was to hook the tumour deeply, and after the point appeared on the opposite side, to push the slide forward where it would be held by the point of the tenaculum. The handle of the instrument was set at an angle with the shaft, so as not to interfere with the view or the manipulations. It was decided to try the ecraseur first, and, if this failed, ligation was to be resorted to.

The operation was performed October 7th, 1865. The patient was etherized, but in this state she was altogether unmanageable, as the tongue fell back, carrying the tumour with it; and as her own co-operation was necessary, she was soon freed from the anæsthetic, and held herself bravely during the operation. The tenaculum worked well, but the ecraseur was a failure, both on account of the small portion of the tumour that could be engaged by it, and the limited space to work it in. After several trials it was therefore abandoned, and by placing the finger behind the tumour, and by the use of the tenaculum, I was enabled to draw it so far forward as to bring its posterior surface in view. A large needle, armed with a double silk ligature, was then passed through its base, entering on the posterior aspect. The threads were cut so as to include both sides, and with the assistance of Dr. Agnew, a large mass was thoroughly strangulated. An incision was then made into it, and a small amount of a peculiar gelatinous-looking substance exuded, but there was no disposition to empty itself. This material was at once examined under the microscope, and its character agrees more with the adenoid or glandular variety of morbid growth than with any other form. The drawing of its appearance is herewith presented.

The patient was placed in bed. She slept tolerably well on Saturday night. On Sunday had some sickness of stomach, with vomiting. By night, had marked fever, pulse running up to 120. Experiences no particular difficulty from the tumour, but is very sensitive to light, and wishes the room darkened.

On Monday the same symptoms continued in a more aggravated form, but on inspection the mass of perfectly strangulated matter seemed sufficient to account for them, as they were in no wise different from those of a person having an ordinary sloughing wound. Acetate of ammonia and morphia were given, and also a mouth wash of permanganate of potash was used.

The patient was closely watched throughout. At 7 o'clock Monday evening, she said she felt better, and would like to sleep. She got on very well until one o'clock A. M., when she complained of *lightness in the head.* At 2½ o'clock she had a sense of smothering, but at 4 o'clock, after waking, she talked about what she would like to have for breakfast, and again went to sleep, having previously spoken of the peculiar sensations in her head. At 15 minutes of 5, Dr. Andrews, the resident in charge, was called in great haste by the nurse, who said that she could not arouse Mary, and that she had some difficulty in drawing her breath. The doctor found her in the following condition. Entire unconsciousness; respiration interrupted, two or three quick gasps, followed by a pause of at least one minute; lips blue; face livid; pulse small, quick, irregular. He thought the tongue had fallen back, and pulled it forward by passing the finger around the tumour, but did not hold it there, as there was no perceptible change in the symptoms. Œdema of the glottis had been all along the prominent accident in mind, and thinking there was trouble of this kind, the doctor at once performed laryngotomy, and inserted a tracheal tube. This had the effect of rousing the respiratory movements for a little while, but the patient soon fell into the same condition as before; I was sent for; arrived at about 6 o'clock, and found her in the following very peculiar state. Entire unconsciousness; head thrown back; eyes open, conjunctiva injected, pupils perfectly fixed, and of medium size. She would lie perfectly quiet for 58 seconds, timed by the watch, and during this time the pulse would become slow, and sometimes fall as low as 60 beats per minute, then would come two or three quick, jerking respirations, accompanied by the expulsion of frothy and bloody mucus from the tube. The blood was from the cut. The discharge had a very offensive smell. The quick respirations would soon subside, lasting only a few seconds, then there would be an interval of 58 seconds, again to be followed by the jerking respirations. During the interval the lips and fingers were livid, and this lividity would partially disappear while the respirations were going on, but they did not continue long enough, at any time, for the complete disappearance of it. Percussion was clear over the whole chest, and *during the respirations* the air could be detected permeating the lungs, the mucus only interfering with it, and producing the ordinary râles. Artificial respiration was resorted to, although to no effect, for the patient was evidently not dying from apnœa. Galvanism produced contractions of the external thoracic muscles in a perfectly normal way, without any influence on the condition. Strong ammonia, applied to the nostrils, produced facial contractions, but had no effect in arousing consciousness or stimulating respiration. Cut cups were applied to the back of the neck, but did no good. The anal sphincters were relaxed, and the rectum would not retain injections. Deglutition was not performed, as fluids placed in the mouth regurgitated, although on two occasions I thought I noticed an act like that of swallowing. These phenomena continued until 12 *minutes before* 9 *o'clock A. M.*, when death took place. Shortly before death the respirations were shorter and somewhat more frequent, and consciousness was totally absent, as it had been from the beginning of the serious symptoms.

Autopsy eight hours after death.—Rigor mortis well marked. Patient was menstruating at time of death. The membranes of the brain were very much congested throughout, but the cerebellar membranes and those of the medulla intensely so. The brain substance appeared to be healthy every-

where, both as to consistence and colour. There was no abnormal amount of fluid in the ventricles.

Thorax. The lungs were crepitant but markedly congested on the inferior and posterior portions. The bronchia contained a considerable amount of frothy and bloody mucus. The heart was healthy, and contained no fibrinous clots; even the *right* cavities were freer from blood coagula than usual, and presented nothing like the appearance of distension, as in ordinary cases of asphyxia.

The abdominal viscera were healthy.

There was nothing abnormal in the larynx or trachea, no œdema of the glottis, or anything interfering with the calibre of the main air-passages.

Remarks.—I think there can be no doubt that this patient died from disturbance of the brain. The phenomena presented for four hours before death, and the autopsy confirm this, but I confess I am unable to establish a clear relation between the tumour and the fatal involvement of the great nerve centres.

Three views may be taken of the case. 1st. Suffocation by the falling back of the tumour, and death by ordinary asphyxia, the brain becoming fatally congested in a very short time. 2d. Reflex paralysis from including a large number of the filaments of the glosso-pharyngeal nerve, the irritation being transmitted from there to the ganglionic connections of the pneumogastric and to the medulla, and thus influencing the respiratory actions, the vessels of the brain at the same time becoming abnormally distended through some peculiar influence on their walls. 3d. Coincidence.

As to suffocation. By this I mean death by the backward pressure of the tumour, or by œdema of the glottis. The last condition we know positively did not exist. If the *accident* had happened, could it have occurred without a struggle on the part of the patient? Is it possible for a person to be suddenly choked in the open air without having convulsive movements? The peculiar and violent efforts of the victims in such instances are known to all, and are particularly dwelt on by authorities. In this case there was no struggle. The evidence is positive on this. I have carefully sifted it, and find that at no time was the patient unwatched. The regular nurse saw her every few minutes, and a middle-aged and reliable woman was with her in the interim, and took great interest in her. Both of these say there was no struggle or fit, and that they did not know anything was wrong until they tried to waken her. When Dr. Andrews came, his efforts to relieve her, by drawing the tumour and tongue forward, were of no avail, and thinking the case was certainly one of suffocation, and that the cause might be lower, he performed laryngotomy without effect. There was no sudden inspiration, nor any of the phenomena of relief that ought to follow such a procedure. Lateness, I think, could not be claimed, as the patient lived three and a half hours after the laryngotomy. Then the *post-mortem* appearances. There was none of that packing, as it were, of the great veins and the right side of the heart, which peculiarly belongs to ordinary asphyxia; on the contrary, the heart was not *engorged* with blood in any of its cavities. About the time of the death of this patient, a man was waiting his discharge in the medical ward, who really *did* suffocate, and whose case affords a striking contrast to the one under consideration. He was in for syphilitic disease of the larynx. For days his breathing was of the most laboured and convulsive character. He would have violent paroxysms, would become perfectly livid, and his veins would distend almost to bursting. Then partial relief would come by relaxation, and he would

struggle along, having paroxysm after paroxysm, until finally what appeared to be the last one came. He became perfectly unconscious, breathless and pulseless, and drawn up, in the sitting posture, with his knees to his chin. Dr. Wm. Pepper hastily performed tracheotomy and inserted a tube. There was no response. The man to all appearances was dead. Artificial respiration was resorted to, and after more than a minute there came a gasp, which was followed by others, and finally the man was restored, and is now about pursuing his avocation. He breathes through the tracheal tube, and enjoys tolerable health. I have merely related those points of his case bearing on the asphyxia.

I am inclined to adopt the view that this was a case of transference of irritation from the ligated tumour to the respiratory centres, and that the vessels of the brain became secondarily involved, as indicated by the "lightness in the head" and the drowsiness. The breathing phenomena already described are not unlike some of those following lesions or divisions of the pneumogastric; and although this nerve was not directly involved in the operation, its intimate connections with the glosso-pharyngeals could easily make these the transferrers of irritation to the centres which are so near each other. To be sure there was no *detectable* change in these structures or their centres, but I do not think that it can be claimed that we know all about the nervous system, and the alterations that occur in it. I am well convinced that the death was not one from mechanical obstruction to the larynx, and in this all who saw the case agree.

Coincidence is a mere suggestion, and, of course, one upon which no data, other than the mere facts of the case, can be given.

Fatal Peritonitis in Typhoid Fever, without Perforation of the Bowel. Dr. ALFRED STILLÉ reported the following case:—

July 1, 1865, I was called, in consultation with Dr. Keichline, to see his patient, Master B., a lad of seventeen, who was convalescent from a mild attack of typhoid fever, which had begun about three weeks before. The day previous to my visit, while still in bed, and without any known imprudence in exercise or diet, he was suddenly seized with a severe pain in the right iliac region, with general coldness and collapse, from which reaction took place gradually, with fever. At my visit, twenty-four hours afterwards, the countenance was good; skin of natural temperature; pulse 116, rather feeble. Intelligence unimpaired; no vomiting, nor stool; flatus discharged with relief; abdomen moderately tense and motionless during respiration. Full inspiration occasioned pain in the right iliac region, but the whole abdomen was somewhat tender to pressure with the hand. In addition to oil of turpentine, of which six drops were taken every three hours, bran poultices to the abdomen, and beef-tea for food, one grain of opium every four hours was prescribed.

The following morning we learned that the patient had passed the night comfortably, without vomiting or stool, and with less pain. There had been some discharge of flatus from the bowels. The facies was good; the tongue moist and clean; the hands cool, but the feet warm; the legs extended; there was no spontaneous pain except on passing wind; abdomen less tender, but rather more tense.

The following day the pulse was smaller and feebler (150); respiration 24; abdomen more distended and motionless, very resonant to percussion, but not very tender; legs can be moved freely without pain; appearance of exhaustion; intelligence perfect. Large turpentine enemata were prescribed in addition to the other remedies. These symptoms continued during

the day, the exhaustion becoming greater; no vomiting occurred, and but little discharge of flatus. Assafœtida was substituted for turpentine in the enemata, and produced a copious discharge of flatus with marked relief.

On the fourth day of the attack, the evidences of exhaustion were more distinct; the abdomen was rather less tense, and scarcely tender to the touch; three or four liquid stools were voided, and the urine was passed involuntarily. On the fifth day, Dr. Fricke was added to the council. Patient's debility increased, the pulse fell from 150 to 128; the skin remained warm, and the mind clear. There was still no vomiting, but several very fetid liquid stools were voided, with abundant flatus. In the evening wandering delirium commenced and jactitation; the skin became clammy and cold, and the head hot; the pulse grew more rapid and feeble, and death by exhaustion took place the next morning about seven o'clock.

On the following day I examined the body in presence of my professional associates in the case. It had been preserved in ice. The abdomen was less distended than during life; its surface was mottled with green and blue; its cavity contained about a pint of *nearly clear serum;* the upper surface of the intestines was of a dull, reddish or brownish colour, dry and sticky to the feel, and their folds were, in many places, adherent to one another by very slight and soft films of lymph. These adhesions were most distinct and firm in the right iliac region, but were easily broken up without laceration of the intestine. A very careful inspection failed to discover any opening into the bowel; but at several points there was a depression showing that there the peritoneum alone bounded the intestinal cavity. These depressions were one or two lines in diameter. The mesenteric glands were moderately enlarged, but not softened.

The glands of Peyer in the last eight or ten inches of the ileum were all enlarged and ulcerated, as well as the isolated follicles. In most of the former, the remaining gland substance had a fungous appearance, projected above the general level of the mucous membrane, and was surrounded by a hard and sharply defined edge. In some glands a portion of the follicles had been thrown off, giving to what remained a ragged, warty appearance. In several the tissues had been destroyed to various depths; and in two at least, corresponding to the external depressions before noticed, the ulcers reached quite to the peritoneal coat, but without penetrating it. There was an ulcer on the edge of the ilio-cæcal valve, about a quarter of an inch in diameter, and fungoid like the rest. Within an inch of the valve, and in the colon, were several enlarged, but not ulcerated glands.

This case has been recorded in confirmation of the proposition, already sustained by the published observations of Rayer, Jenner, Shattuck, Mayne, and others, that the occurrence of peritonitis during typhoid fever, by no means implies that perforation of the bowel has taken place. It was also singular in the absence of vomiting from among the symptoms, and in the ability of the patient to extend his limbs. Those peculiarities were so striking as at one time to inspire some suspicion that the diagnosis of peritonitis might not, after all, be correct. Under similar circumstances I should be disposed to recommend mercurial medicines in minute, as well as opium in full doses, believing that they would afford the patient one chance more for life.

REVIEWS.

ART. XV.—*Clinique Médicale de l'Hôtel-Dieu de Paris.* Par A. TROUSSEAU, Professor de Clinique Médicale de la Faculté de Médecine de Paris, Médecin de l'Hôtel-Dieu, Membre de l'Académie Impériale de Médecine, Commandeur de la Legion d'Honneur, Grand Officier de l'Ordre du Lion et du Soleil de Perse, Ex-representant du Peuple à l'Assemblée nationale, etc. etc. Deuxième édition, revué et augmentée. 3 vols. 8vo. Paris: Baillière et Fils. 1865.

Medical Clinic of the Hôtel-Dieu. By A. TROUSSEAU, Professor of Clinical Medicine, etc. etc. Second edition. Paris: 1865.

THE name of Trousseau needs no introduction to a medical public anywhere. He has been before the profession as an author for nearly, if not quite, thirty years; for that period he has been a clinical teacher in the largest hospital of a city renowned for the excellence of its medical institutions and the abundance of its opportunities of study, and to which students are attracted from every quarter of the globe. As a writer, as a lecturer, as an active worker in his profession, he has established a reputation which it is safe to say extends into every country where medicine is cultivated as a science or practised as an art. To his untiring industry, we believe, he owes this wide-spread reputation as much as to the high position he has held, or the great abundance of his natural gifts. He has exercised that quality without which there is no success, and through a long life has been a patient, earnest, devoted, even enthusiastic labourer in the field of medical science. Writing to an intimate friend upon the subject of his resignation of the chair of clinical medicine, which was tendered only last autumn, he says: "The extreme facility of addressing the pupils, and clearness of expression that have been imputed to me may be, perhaps, natural gifts, but they have also been purchased *with great labour*. Every morning I am at work by six o'clock, and half my evenings are similarly employed; for I take my clinical teaching as a serious duty, and I endeavour to keep myself up with the current of every new idea."

No work worthy of his reputation has appeared in our language,[1] the *Prescriber's Hand-Book*, bearing the name of Reveil as well as his, being elementary in character, and upon a subject affording little opportunity for display of powers. His large work on Therapeutics, written in conjunction with Pidoux, has never been translated; it is a master work upon the subject of which it treats, a treasure-house of collected wisdom and original research for all interested in the study of this particular branch of medical science. It will be noted as a singular fact, that all these works are joint productions of himself and some other writer. But on the title-page of the work before us, his name stands alone; and it is not only for this reason that it demands especial attention, but because it is the production of his mature years; it contains the experience of a life spent in learning and teaching,

[1] We may except his work upon Laryngeal Phthisis, the joint production of himself and Belloc, a prize essay of the Academy of Medicine, which was translated by Dr. J. A. Warder, and published in Dunglison's American Medical Library.

of one who has occupied high position, enjoyed abundant opportunities, expended great energies, been favoured with rich gifts of intellect. Such a legacy left by such a man to his professional brethren of the world, just as he is about to leave it, merits our earnest examination. In attempting to give our readers some idea of this legacy—to give them such a view of the *Clinique Médicale* as will enable them to judge of its contents and its merits—we confess to no little misgiving. Three octavo volumes of over eight hundred pages each, upon the subject of clinical medicine, are not easily examined, analyzed, and their contents fairly presented; especially is this the case when they are the production of a master like Trousseau; and anything like a thorough examination of the work and the subject would extend far beyond the limits of space in any journal. Believing, however, that our professional brethren will be pleased, as well as benefited, by an incomplete view, or one in which, perhaps, nothing like justice can be done to the merits of the author, and by such an examination as we can make of selected lectures, we address ourselves to the task.

Very fortunately we are aided in our undertaking by a fact at once striking and unusual; the existence of a work in our own tongue, which was not only the model for the *Clinique Médicale*, but in no small degree helped to make the man who wrote it. We allude to that most excellent work, too seldom seen in the hands of students and young practitioners of the present day, *Graves' Clinical Lectures on the Practice of Medicine.* Trousseau has been a devoted student and an ardent admirer of Graves; he has modelled his work after his—has modified his therapeutics from his experience—has even named a disease after him! for bronchocele associated with exophthalmus, he called *Graves' Disease!* These statements are not implied or a matter of judgment, but are made directly by the author himself. Only three or four years since, a French translation of Graves' work was published, to which he furnished an introduction. In this introduction he entreats those of his pupils who understand English, "to consider it as their breviary," and says, "of all the practical works published in our time, I am acquainted with none more useful, more intellectual." Farther:—

"I have incessantly read and re-read the work of Graves; I have become inspired with it in my teaching; I have endeavoured to imitate it in the book I have myself published on the Clinique of the Hôtel-Dieu; and even now, although I know almost by heart all that the Dublin professor has written, I cannot refrain from re-perusing a book which never leaves my study."

Generous testimony, and heart refreshing, in a world which has never abounded with instances similar to it; and what reward to the lamented Graves, could he have seen such fruit harvested from seed he had sown, and such evidence of the value of his talents and his labours!

After stating that the work is modelled after that of Graves, we do not know that more is necessary as to its aim and scope. Faithful to its character of "clinical," it passes from subject to subject as the physician passes from bedside to bedside, finding a different disease in each. The only appearance of method is the grouping of the exanthemata with which the first volume opens; yet without the order and arrangement of a regular treatise on practice, the work is so extensive as to range over the whole domain of medicine, and few if any of the important diseases are omitted, while in regard to some of them, he is, in fact, copious of detail.

The form of lectures affords to the author more freedom of illustration than would become a formal treatise, more familiarity of address, and more impressiveness of manner. It is a form to which his style is pecu-

liarly adapted; easy and flowing, yet dignified and often eloquent, it resembles that of our Watson, and the perusal of this work, like that of the *Lectures on the Principles and Practice of Physic*, is often more a pleasure than a task.

The present is the second edition of the work; the first was in two volumes, and was not long before the public until it was exhausted; in preparing a new one, the author has enlarged it, by the addition of new subjects, rather than by the modification of doctrines which, he intimates, he is not likely to change at his time of life. The principal subjects considered in this edition and not in the first, are: neuralgia, glosso-laryngeal paralysis, hydrophobia, chlorosis, purulent infections, uterine phlebitis, phlegmasia dolens, retro-uterine hæmatocele, cerebral rheumatism. Some of these, it will be seen, are generally found only in works on diseases of females; but besides these, in the work there are lectures on amenorrhœa, menorrhagia, and puerperal convulsions.

As the first three chapters of the work of Graves are devoted to subjects introductory and accessory to the study of clinical medicine, so Trousseau opens with an "introduction" where, within the compass of about fifty pages, are to be found his views upon many subjects of the greatest importance and the deepest interest both to students and to practitioners. The aim, importance, and best method of studying clinical medicine, the relative duties of the clinical teacher and of those who follow him, are touched upon, and then he branches out into brief disquisitions upon the science and the art of medicine, the nature of disease, the power of remedies, empiricism, and rational therapeutics, with other kindred subjects. No one, certainly, is better entitled to speak as a master or be received as authority, and we shall therefore pay particular attention to this part of the work, and quote from it liberally, not only because of its inherent interest, but, the author being here free from detail of symptoms or statement of treatment, it affords, perhaps, the best specimen of his style.

First of all, he is in favour of an early attendance upon clinical instruction, believing that the information gained, although at first confusing and fruitless, will nevertheless be soon valuable. Differing from what we believe to be the generally received doctrine, he prefers that the medical should precede the surgical clinic. Perhaps the love he bears for his department of the profession has warped his judgment in this particular, for it certainly seems reasonable that things to be seen, felt, and handled are better subjects for "first lines" than those which are hidden from direct observation; that it is easier for a beginner to understand the deformities of a broken or dislocated limb, and the *rationale* of its treatment, than to trace a cough to its pathological origin, and comprehend the therapeutical influence of the remedies prescribed.

But we will let him speak for himself:—

"The young man is attracted by the spectacle of surgical operations; the solemnity of the preparations, the address of the surgeon, the direct results obtained by the operator, strike and seduce his youthful imagination; but he is only assisting at a barren spectacle for him. Even to understand the mechanism of the reduction of a fracture or a luxation requires a considerable acquaintance with anatomy and physiology; and the student who witnesses those delicate operations in which the surgeon does not make a stroke of the bistoury without recollecting the most minute anatomical details, cannot comprehend how much skill, and coolness, and intelligence are necessary to effect results immense for the operator, but inappreciable by him who as yet knows nothing. I have always observed that young gentlemen are more attracted by those operations

which demand scarcely more intelligence than is necessary to a butcher for the slaughter of an ox, than by those marvellous procedures, those delicate and intelligent manœuvres, which are the work of the true surgeon, and which fill with admiration those who, being already profoundly instructed, can comprehend and appreciate them. You will not, therefore, derive much profit from attending the surgical wards until you are well grounded in anatomy, while for the first steps in medicine some superficial notions of physiology will suffice. You will habituate yourselves to see patients, to read upon their countenances the gravity of the disease; you will learn to feel the pulse, and to appreciate its qualities; you will take your first lessons in auscultation and percussion; you will learn early to recognize the great functional disorders of the various systems of the economy, the modifications of the secretions and excretions; you will see in the autopsy-room some of the relations which exist between the cadaveric lesions and the symptoms or signs observed during life; and already in a few months you will have learned many things of great value. It is very true, there will be a great many undigested notions; but, step by step, the teachings, and, above all, the familiar conversations of your preceptors and of your fellow-students, will aid you in arranging and mastering these materials, and you will soon have acquired knowledge enough to make your future studies attractive."

Then follows a paragraph which betrays the true lover of his profession:—

"It seems strange to the world to hear physicians talk of the charms which attend the study of our art. Yet the study of letters, of painting, or of music gives no more lively pleasure than the study of medicine, and he should renounce our profession who does not find in it, from the beginning of his career, an attraction almost irresistible."

Our author, like his prototype, Graves, is not in favour of students devoting much time to the accessory sciences, and both select chemistry, as being peculiarly the "handmaid of medicine," for the subject of especial remark. As the latter tells his readers that it is not necessary to "dive into all the arcana of the science," and load their memories with "atomic numbers, symbols, and equivalents," because their time is limited, and because "few and scanty, indeed, are the rays of light which chemistry has flung on the vital mysteries," so Trousseau takes the same ground, and for the same reasons. They are not alone, however, in this; we believe it is a common doctrine with teachers of clinical medicine. We can call to mind several who also teach it, among them one of the best writers upon clinical medicine in our language, Dr. Latham, the author of *Diseases of the Heart*. He, too, when reminding the student of the many subjects claiming his attention, the professor of each too apt to urge his own as indispensable, forcibly impresses upon him the fact that the "*life of man is but three-score years and ten*," as one imperative in its claims to attention, and despotic in its commands to sacrifice the desirable and ornamental to the practical and indispensable.

"The little time you have to devote to medicine renders the study of the accessory sciences extremely difficult for you. It is important that, before entering upon your medical studies, you should have obtained sufficient knowledge of chemistry and of physics to understand the application of these sciences to medicine; but I should profoundly deplore the time you would lose in attempting to acquire a too extensive knowledge of chemistry. Although chemistry renders to medicine, properly speaking, but very limited services; although, in general, men the most eminent in chemical science have been but poor physicians, and, at the same time, the true practitioners have always been but sad chemists, I would nevertheless admit that it would be desirable for the physician to have the most extensive knowledge possible of chemistry, if only to convince him of the vain pretensions of this science, which claims to understand and explain the

laws of life and of therapeutics because it understands and explains some of the reactions which take place in the economy. The life of man is scarcely sufficient for the study of physiology, medico-chirurgical pathology, and therapeutics; why, then, demand the student to dissipate his attention in the pursuit of accessory studies, which, if not completely useless, are nevertheless of too little importance to sacrifice for them physiology, clinical medicine, and therapeutics, without a knowledge of which there can be no such thing as a physician."

He then propounds for the chemists the problem of the egg fecundated and non-fecundated, and challenges them to show, by the most minute chemical analyses, the difference between the two; and concludes that if "the retort has its mysteries," as the chemists claim, the impregnated egg has them also, and of even a stranger character! But, evidently fearful of being misunderstood upon this point, he says:—

"But it is far from my intention, gentlemen, to arraign and condemn the accessory sciences of medicine, and chemistry particularly; I only condemn an exaggerated estimate of the value of these sciences, and their pretensions, and their maladroit and impertinent interference with our art. No one maintains, so far as I know, that all the compositions and decompositions, all the molecular movements, all the manifestations of the forces belonging to the vegetative life, may not be physico-chemical acts; but if there be some among these manifestations governed by the same laws that rule over dead matter, there are also others, and they are the most numerous, the most important, the most essential to the living matter, which obey laws essentially different; laws which chemistry may perhaps discover some day, but which for the present remain autonomic, special, unexplained, inexplicable, and before which chemists and physicians stand alike vanquished. Let them maintain, if they will, that in a future more or less distant they will subordinate the laws of life to those of the retort; I consent; but, until the new order of affairs is established, I desire them to be modest, and not to thrust upon us their hopes for acquired truths. I willingly confess my ignorance as a chemist, but upon condition that they confess theirs as physiologists and physicians."

The nature of disease is the next subject in regard to which our author attempts to inculcate correct ideas. Probably there is no other point than this upon which physicians and the laity are so wide apart, and the first thing for the student of medicine to do is to dispossess himself of all the current popular notions in regard to the material nature of disease, and to learn, once for all, that it is a changed mode of being, and not an entity. To the inculcation and illustration of the similarity between physiological and pathological processes the author devotes several pages. Starting with nutrition, the derangements of which play so prominent a part in disease, he makes the striking comparison of each ultimate organic molecule to an animal "with a mouth represented by an artery, an anus represented by a vein," and the mass of granules and nucleoli making up the cellule for a body; the compositions and decompositions proceed harmoniously until the artery supplies food too profusely, producing a temporary embarrassment, from which the cell soon recovers by its own inherent powers; the next step is to consider the little animal supplied with unhealthy food—a vitiated blood comes to supply its wants, producing a more profound derangement of its internal changes, from which, however, recovery without aid is by no means improbable. Passing now to the general system, he finds a starting-point in the slight febrile condition which follows a hearty meal—the fever of digestion—the simplest form of disease, which speedily terminates in health, and thence to wider and more complex departures from health. All this is very fine; excellent for the student in every respect. It is intended, of course, merely for a sketch of the subject, and by no means aims at its

exhaustion; its lesson is the power of nature to restore the disordered economy to a state of health, and that there are times when the physician "cannot be more useful than by limiting his efforts to the observation and direction of the vital forces." Upon this topic we will quote from him directly:—

"We believe too much in ourselves, and we have too little faith in what we metaphorically call *nature*. We do not bear sufficiently in mind that the morbid impulse having been given, matters will return again to their normal condition, and that nothing should be so much respected by the physician as this return to activity of the natural functions, which will henceforth do more for the cure than all the agents of the materia medica.

"When, under the influence of that particular modification of the economy which, for want of a better name, we call *inflammation*, an effusion of serum and of plastic lymph has taken place in the pleura, we essay to interfere, and, let us say, in a great number of cases we interfere beneficially, but the limit of that interference is what most physicians understand the least. To see the obstinacy of our medication, the incessant and tumultuous activity of our therapeutics, it seems as if we distrusted nature and jealously wished to do everything ourselves, and without her aid. Now, when once the inflammatory state is dissipated, something yet remains, and this something, so clearly appreciable by auscultation and percussion—I speak of the exudation—engages our attention, and demands our consideration more than the local lesion which produced it. We refuse to believe that the inflammatory orgasm having been dissipated, that immense organic cellule, which we call the pleura, can return to its normal functions and do what the ultimate organic utricles do without cessation in the act of nutrition. The pleura will go on and absorb and scatter the morbid products it contains, and ordinarily it will suffice for this task, which, however, it generally accomplishes but slowly. I accept, without difficulty, the fact that paracentesis will spare it much labour, even as a thorough emetic is the best and most salutary of remedies for an overloaded stomach; however, when the effusion is most excessive, when there are irrevocable tubercles in the lung or on the surface of the serous membrane, the natural functions and innate powers of the pleura suffice for the resorption of the effused liquid, and the production of a definite cure."

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"Once more, gentlemen, do not forget that in acute diseases the time for beneficial action passes rapidly, and the time for expectation speedily arrives; and while freely admitting that in chronic diseases the active, patient, and renewed intervention of the physician may long be useful, nevertheless, even in this class of cases, we must sometimes close firmly our hands, which are full of medicines, and wait yet a few days; very often we shall then see the normal functions, which were overcome, oppressed, or exhausted, reawaken, and we can assist, with pleasure, the powerful efforts of that force, which has been named, without being too well understood, the *vis medicatrix naturæ*."

It must not be inferred from these extracts, of which we admit the language to be strong, that Trousseau's treatment of disease is mere expectation. All through the work we find active and energetic medicines prescribed, and, indeed, in this respect his therapeutics approaches more nearly to that of British practice generally than any of his countrymen with whose writings we are familiar. This is but another example of the influence of Graves, an acknowledged example, too, for in the "introduction," already alluded to, he says that from him he learned the use of "mercurials, essence of turpentine, spirituous liquors, nitrate of silver," and some other remedies used by the Irish practitioner so differently from the French. It is the unnecessary use of active remedies against which our author would guard, because if unnecessary almost certain to be injurious. Thus, further on in the work, in the lecture on erysipelas of the face, he says that, unless under

special conditions, it is a disease almost certain to end in recovery without aid; that of fifty-seven cases carefully observed in hospital practice, and untreated, but one died, and of all he ever saw, hospital and private practice together, not more than three have died. With so slight a mortality, why resort to active medication, he asks, especially as he has reason to believe that one of the deaths which did occur could be more fairly attributed to the treatment received than to the disease. Speaking of pneumonia, on the other hand, he says that he has long been tempted to leave acute pneumonia to nature, being inclined to doubt the powers of medicine over it, yet he could never feel justified, or as if he had fulfilled his duty, did he fail to make use of antimonials, emetics, and digitalis, convinced, as he is, of their utility.

He is not, then, a discarder of medicine, but a firm believer in the necessity and the practical utility of a knowledge of the course of diseases when uninfluenced by remedies. "*To know the natural course of diseases is more than half of medicine.*" "By the aid of this compass the physician can surely direct his course in the difficult study of therapeutics; it is by this he will be enabled to appreciate systems as they succeed one another, each speedily dying overwhelmed by the advancing waves of its successor."

But how to learn this natural history of disease? It is not an easy task. Our author admits that it is not, and confesses that if difficult and embarrassing to those of age and experience, who have passed a lifetime in hospitals, it must be infinitely more so to the beginner. But he advises him to begin early to make and record observations, to "follow the practice of several physicians, depend not too much upon the word of the teacher, do not remain servile scholars, follow, observe, compare." He alludes to the inference which cannot be escaped when a certain disease is seen generally to end in recovery under modes of treatment directly opposite; he advises particular attention to cases brought into the hospital having passed many days without any treatment, and advises an entire abstinence from remedies, in some cases, where life is not at stake. The manner of conducting, and the extent to which experimentation in the treatment should be pursued, is then the subject of some excellent remarks, guarded by the statement that there could not be a physician in the world who could experiment merely for the sake of the experiment, but always guided by some facts and observations previously acquired, and influenced by the hope of rendering further service to suffering humanity; that experiments made only for curiosity would be culpable; and then follows a passage alike honourable to his head and his heart:—

"But how much more culpable still would be the physician who experimented in the hospital; there, where that responsibility is absent which, in private practice, often makes him tremble; there, where he is not to answer for the interests of his position which might be compromised; there, where the patients are under his authority and cannot resist, except at the risk of being ejected from the hospital and left without asylum and without succor. Strive, gentlemen, if you have ever seen such conduct, so rare, thank God, strive not to imitate it. You will prepare for yourselves remorse which will follow you throughout your career."

The subjects of empiricism and rationalism are but briefly, yet most ably, touched upon; their intimate connection, and the impossibility of sundering them is most clearly shown and strongly impressed. "If the primordial fact be purely empirical," he says, "its consequences and its relations belong to the intelligence of the physician who knows how to discover them." He most happily illustrates this by the example of Peruvian bark, the use of

which was at first purely empirical, but by the labours of Torti and Sydenham has been extended, and its powers, as it were, multiplied, until its application forms almost a system of medicine, while of its mode of action we remain as ignorant as those who first used it. All this is so well presented as to deserve reproduction here.

* * * "Thus, then, even when a remedy is adapted to but one disease, when nothing, no induction, directs us to a trial of it; when, consequently, it seems to belong exclusively to the domain of empiricism, the physician can still step in with his intelligence and institute a system of medication with but a single medicine.

"He does not systematize; he does not theorize, but he appreciates the opportunity for the use of the remedy, its influence in the special case and the duration of that influence. He regulates the doses and the repetition of these doses. He seeks means of rendering the medicine more inoffensive. He examines if there does not exist, in the accessory conditions of the disease, other indications which experience has already taught him to appreciate and to meet. He sees that the anæmia which accompanies malarial poisoning yields with readiness to the same remedy which succeeds so well in the chlorotic cachexia, and iron becomes, in the hands of the physician, a useful adjuvant unknown to the empiric. The empiric can cure a paroxysm of the fever; it belongs to the physician to cure the fever itself. The physician is able to make a diagnosis impossible to the empiric. To know that a patient has, every day, a febrile paroxysm, commencing with a chill which is followed by fever and sweating, this is a matter of the most common observation; it is not a diagnosis: but to know that the paroxysm is not connected with a hidden phlegmasia, a deep-seated suppuration, a special disposition of the nervous system, so common in certain females—to know that it is really the expression of the influence of the malarial poison—this is an exceedingly complex notion which can only belong to the domain of the physician. To appreciate now the gravity of this poisoning, the influence which it has exercised, and which it will yet exercise upon the individual affected, and to proportion consequently the duration and the energy of the medication to the gravity of the disease; this again is what does not come within the powers of the empiric.

"Again, when it becomes necessary, in cases of masked fevers, simple or pernicious, to find the clue which leads to a notion of the cause and of the intimate nature of the disease; when in case of a man who has a cough, orthopnœa, bloody expectoration, a stitch in the side, it becomes necessary to lift the deceitful mask and discover the intermittent fever which demands imperiously the immediate employment of quinia in large doses; when it becomes necessary to seek and discover the same indication in the midst of the most violent disorders of an accession which is prolonged and affects the forms of a continued fever; in such cases the physician alone can interfere beneficially, and the rude empiric, who, by chance, has cured a paroxysm of intermittent fever, is unable to manage the resources of therapeutics even in the most simple cases of the disease, and knows not even what article to make use of in its complex forms."

We must pass over now much that would be interesting to our readers, well worthy of reproduction. The variety of nosologies and nosologists is strikingly pictured; the most perfect independence of judgment is inculcated, and the great importance of personal observation is impressed, and these subjects occupy several of the following pages. He then enters into a consideration of the methods of study, and an inquiry as to which is the best. All of them are founded upon the observation of facts, and observation implies comparison; to see, observe, and compare, are the elementary proceedings; upon this all are agreed; but, when it comes to the interpretation of the facts observed, there is a diversity of method pursued; there are two principal methods, "one called the modern, the *numerical method*, the other the ancient, or the *method of induction*." There are

several paragraphs of comparison and comment upon these methods, so admirable that we cannot omit them, and only regret that we cannot give the subject entire.

"The numerical method has taken for its device the celebrated phrase of ROUSSEAU: 'I know that truth is in things, and not in my mind which judges them; and that the less of myself I put into the judgments I make of them, the more sure I am of approaching the truth.' The second is that which has thus far been followed by all the great practitioners, whatever may have been their doctrines in other respects; it has been maintained by the majority of the professors of our faculty. * * * * * *

"The numerical method recognizes the sovereign power of figures. The physician must restrain the bursts of his imagination; he analyzes, counts, and sternly registers the results; nothing more, nothing less. It is the inflexibility of the upright magistrate who administers the law without listening to his passions or his inclinations; it is the rigor of the statistician, who, making up a table of mortality, takes no account of the causes of death, but limits himself to a calculation of the expectation of life of the mass of the population. The numerical method, finally, applies to medicine the calculation of probabilities in all its severity.

"The method of induction proceeds entirely otherwise; it collects, analyzes facts; but it also compares, and not alone counts them. Instead of the *necessary* result of the statistics, it seeks something else, the systematic connection of the facts, their union; it interrogates them, comments on them, separates them, groups them, examines them in all their aspects, in order to draw from them some new application. In a word, reversing the numerical method, '*it puts the greatest amount possible of self in the judgments which it renders upon things, being very sure of thus approaching more nearly the truth.*'

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"I do not reproach the numerical method with counting, because we cannot systematize without counting; but I reproach it for only counting; in a word, for adhering to the exact result like the mathematician. I reproach it for counting too much, for counting too long, for counting always, and for not being willing to put mind into facts.

"This method is the scourge of intellect; it makes of the physician an accountant, a passive servant of the figures he has added up; and the greatest reproach I have against it is of stifling medical intellect."

After showing somewhat more at length the difference between the two methods, and that the counting of the numerical method is no more exact than the results of the other method, he continues:—

"And do not imagine, gentlemen, that this mathematical exactitude really exists; it is only relative, for it changes under the observation of the same person, according to the year, according to the season, according to the medical constitution. So that the same fact which was observed one time in five last year, this year occurs but once in ten; next year, perhaps, it will happen but once in twenty; so that your law, your *real truth*, is not absolute, and cannot be; and if the pathologist seeks to formulize the facts which twenty partisans of the numerical method have given, each as the expression of extreme exactitude, he is still obliged either to take an average, which to-morrow will be no longer correct, or to recur to those axioms and detestable expressions, which it is attempted to banish from medical language: *sometimes, often, very often, generally.* * * * * * * * *

"'But,' you may say, 'the numerical method enables us to verify the assertions of a physician.' Do you then think, gentlemen, that if a person will lie he cannot do it as well with figures as with general statements? Do you think that unreliable and false physicians, if such exist, will not make up a numerical statement as well as any other? Such an one will only take the trouble of lying more precisely than another; he will be untruthful in the history of which he

has fabricated the details, and give an exact result; the other, with less labour and hypocrisy, will only deceive in the conclusion."

Continuing his remarks upon the collection of facts and the necessity of weighing, rather than numbering them, he continues:—

"'It is better,' says Gaubius, 'to stand still than to advance in darkness.' But how has the human mind advanced from the commencement of time? I ask you, was it not to verify an hypothesis that the adventurous mariner turned his prow towards the west and confided to unknown seas, his genius, his glory, and the life of his adventurous companions? What ideas were germinating in the brain of Galileo before he discovered the pendulum; and do you believe that he needed to see a thousand candelabras oscillate under the dome of Pisa to create that admirable hypothesis which soon entered into the domain of science? Toricelli formed an hypothesis, he put mercury and water in tubes, and discovered a law. Lavoisier weighed the peroxide of mercury, and modern chemistry was discovered. All the science was revealed to him by a single fact. How many millions of persons had seen the steam raise the lid of a tea-kettle? Watt saw it once, the fact was fecund, and the man of genius invented the steam engine, and at once rendered himself and his country illustrious.

"I say then, 'better walk in darkness than to stand still,' if you understand by darkness the primary facts and the intellectual processes which bring forward the secondary ones. Why has God given us a mind which tends incessantly towards progress and devours the future? why has he given us an ever active intelligence restless to compare, to abstract, to induct, to systematize, if not that the faculties of the understanding may work without ceasing upon those primal things which we call facts? And what are the products of this work if not the ideas, the inductions, the hypotheses, the systems, which it is attempted to verify by the numerical method and by statistics?

All this, he says, concerns the science of medicine, not the art; for art and method are terms which mutually exclude each other. *Is medicine a science or an art?* This question leads to a definition of the terms and to the statement that, however desirable it might be to be able to think otherwise, he is compelled to decide that it is, as yet, an art rather than a science. But every science touches upon art at some points, and every art has its scientific aspect; it is so with medicine. For the science learning is necessary, but the artist, in the highest sense of the word, is born, not made. These are his doctrines, and he follows them with a strong admonition to students not to believe themselves physicians because they have some scientific acquirements, which are but instruments for the use of art, as the telescope and the lens are to the astronomer and the naturalist; the learned man and the practical man being very different things.

"Almost all of you, gentlemen, know more of chemistry than Paracelsus, many among you more than Scheele and than Priestley, some even more than our Lavoisier; you know chemistry, but you are not chemists; and, among those who listen to me do you believe there are many whom posterity will judge worthy of a place by the side of these men whose glorious names I have just cited to you? There is, gentlemen, a vast difference between the *savant* who collects and the *artiste* who produces."

The following upon the deleterious influence of an overburdened course of study, and the tendency of multiplied instruments and means of observation to cripple mental development and exercise should be received and remembered as coming from one well qualified by position and experience to speak with authority.

"And, gentlemen, it cannot be denied that the numerous means of investigation which we now possess, by multiplying our primary notions, or at least by

rendering them more exact, do not put the mind in such conditions that its artistic manifestations are more numerous, more practical, or more certain. How is it that the intellect becomes more indolent in proportion as scientific notions increase in number, content to receive and to enjoy, careless to elaborate and to produce? The formulæ of the science aid the art less than one would believe. Chemistry has taught you to make colours; it tells you when and why they do not harmonize; it has taught you to fix them upon canvas more permanently and better prepared; an illustrious man has made known to you the modifications which they exercise one upon the other; in a word, there is a science of the harmony of colours. And yet the blood circulates from the pallet of Rubens, fabrics glitter on the canvas of Vandyck, and the madonnas of Raphael still show all that beauty has of the pleasing and the divine. Why then, with so many means of study, with so many precise scientific notions, do our painters remain so far behind the less-wise masters who are the glory of the art? Why do not we, so rich in preparatory knowledge, so fertile in means of diagnosis, why do not we produce such men as Baillie, Sydenham, Torti, or Stoll? It certainly is not because Nature has been more niggardly in her gifts; every generation brings forth like intellects, and periods of barbarism the most abject have probably had men as vigorously organized as those of Pericles, of Augustus, of Leo X., and of Louis XIV. How many times, in our intercourse with the young men who crowd upon our benches, have we not recognized those choice spirits to whom nothing was lacking to produce fruit, but an opportunity of usefulness and a favourable direction. But those who distinguished themselves by an exceptional aptitude when they had acquired, by a labour, which is perhaps long but by no means difficult, that knowledge which constitutes the preparatory sciences, and to which is unfortunately accorded so large a place; when they had, after some months, equalled or surpassed their masters in the facile art of applying their senses and the various instruments to aid them to local diagnosis, proud of a conquest which had cost them so little trouble, encouraged in this good opinion of themselves by those to whom all medicine consists of these things, they habituate themselves to intellectual idleness and fall into a sort of mental inertia; while our predecessors, less rich than we are in that knowledge which we should so much utilize, laboured without cessation in the work of production; poor, they put under contribution the slenderest acquirements which chance or experience gave them; they exercised incessantly the powers of their mind, as the athletes exercised their muscles, and there resulted a power which sometimes betrayed itself by singular errors but often also by views full of grandeur and fecundity. Efforts were multiplied by reason of poverty of means, and the results were immense; and you, around whom means are so abundant as to embarrass and enervate, satiated with what is so abundantly offered, you only receive and swallow, and your clogged intellect is smothered by obesity and dies unproductive.

"Pray, gentlemen, a little less of science, a little more of art."

It is time to turn to the body of the work and examine some points of theory and of practice. The field of clinical medicine is so extensive, and presents so many subjects of equal interest, that a choice is embarrassing, when but a point or so can be touched upon; we find it particularly so, when almost every lecture seems, perhaps to our too partial judgment, full of valuable matter, presented in a manner making its perusal a pleasure. But we pass over that well-marked class of diseases, the exanthemata, the examination of which occupies some hundred and fifty pages, and the lectures upon erysipelas and herpes zona, together with enteric or typhoid fever, here *dothiënentërite*, and arrive at the anginose affections. We select these for our consideration, on account of the interest which attaches to them, especially of late years, since diphtheria has raged as an epidemic in many parts of our country, and because the experience of our author has been very great with this class of diseases, surpassing even that of any other physician of the French capital. This he attributes to two causes:

first, his long term of service, eighteen years, at the head of the children's department of the hospital; and, second, to his introduction of tracheotomy for laryngeal diphtheria, which has been the occasion of a frequent demand for his services in consultation. Two other facts, which we gather from the work, would also seem to fit him peculiarly for treating of these affections: his frequent visits to districts where diphtheria was prevailing with unusual severity, and his pupilage under Bretonneau, the father of the modern literature of this disease.

The subject of gangrenous angina occupies one lecture. The gangrene may be the result merely of excess of inflammation, when the disease is termed *simple*, a form exceedingly rare, but of which cases are detailed. Far more frequently it is a *complication* of other grave, general, or distant diseases, as dysentery or typhoid fever, or of other throat affections, as scarlet fever and diphtheria. The fact that gangrene is however very rare in the latter disease, is dwelt upon and repeated, because of the deceitful similarity of appearance being likely to mislead the inexperienced.

Following this, comes a lecture upon phlegmonous angina, acute tonsillitis, more commonly known as quinsy, a disease far too low in the scale of importance to merit any attention here, were it not that we find some new views expressed, as well as an admirable illustration of the author's candor, and an application of his views of the importance of an acquaintance with the natural course of disease. "There are diseases," we are told, "which are the glory or the despair of therapeutics; they are those which get well spontaneously, and those which no medication can check;" acute tonsillitis is one of them.

"I repeat, gentlemen, phlegmonous angina is one of those diseases which are the glory and the despair of all medication: their despair, because medicine cannot prevail against them; we are powerless to check their progress, to abridge their duration; their glory, because they cure themselves, whatever we may do, and the temptation is to ascribe to the medication the honour of the cure."

He then sketches the rise and progress of the disease, gives a case in illustration, and passes in detail over the remedies which have been and are prescribed for it; locally, incision, scarification, laceration with toothed forceps; generally, the antiphlogistic treatment, bleeding from the arm, the foot, the ranine vein, cups between the shoulders; leeches around the neck, to the anus, the vulva, and even by Broussais, to the pharynx! He looks with some favour upon evacuants, especially ipecacuanha, where there are indications of derangement of the *primæ viæ;* but, in spite of all, the disease continues its progress; in four or five days, perhaps nine or ten, an abscess forms and bursts, and the patient is well. All the remedies have been useless, the more violent ones injurious.

"As soon as the accidents produced by the angina have disappeared, the return to health is immediate, and nothing more is necessary but to take precautions against a relapse. But the patient has been bled from the arm; at least leeches have been applied in greater or less number; these losses of blood, especially in case of an infant or delicate person, have occasioned an exhaustion, for recovery from which some time will be necessary. This consecutive anemia will be worse than the disease which you have so vainly sought to conquer; it entails debility, loss of appetite, slowness of digestion, palpitation of the heart, and other nervous troubles which may continue to manifest themselves for a month or more."

He does not attempt to conceal the great sufferings sometimes experienced by the patient in this disease when unable to swallow, and apparently

near suffocation, or the fact that he will make urgent appeals to the physician for relief. Nevertheless, in his long and extensive experience, he has never seen a fatal case; he does not deny that it may cause death by extension of the inflammation to the upper part of the larynx, and be productive there of œdematous infiltration, but does not mention death from hemorrhage consequent upon the opening of an arterial branch, when the abscess bursts, several cases of which are reported in Watson, and one case of which occurred under our own observation. He quotes from Louis the report of 23 cases, 13 of which were bled and energetically treated, and 10 were not; the mean duration of the disease was, in the former, nine days, in the latter, ten and a quarter, a result highly favourable to the milder measures.

"Expectation is, consequently, the best treatment you can follow in the disease which now occupies our attention; but this treatment, I admit, is most difficult to make acceptable in practice, especially when you are beginning your career and have not yet inspired that confidence which you will do later. In order to respond to the just demands of your patients, prescribe remedies for them of no great power. If you cannot really cure them, at least leave some illusion to those who suffer, and do not make them despair by avowing your impotence. Order acidulated and demulcent gargles and emollient fumigations, knowing perfectly well that they will effect nothing towards the cure of a disease, which in a short time will come to a termination."

He further fortifies his doctrines by the experience of two of his colleagues, who suffer from repeated attacks of the disease, and have arrived at the same result as to remedies. One of them says:—

"I have become very skilful in the treatment of this disease; I give my patients the ptisan of barley-water when they can drink; I prescribe foot-baths for them, and that is all my therapeutics For myself, I do better still, if possible, I keep my room and my bed, I wait patiently, and my sore throat gets well as soon as formerly."

The author has yet to dispose of those gentlemen who claim, with caustics, antiphlogistics, and revulsives, to cut short the disease during the first or second day. He does it by asking—

"Where, gentlemen, is the physician skilful enough to decide that a sore-throat, which has only begun, will necessarily be a phlegmonous angina? For my part, I plainly declare my incompetence upon this point, and I doubt if others are any more able than myself."

A second answer he has for them in the existence of an angina of rheumatic origin, which he proceeds to describe as painful in character, but ephemeral in duration, and which has given rise to many errors of diagnosis, and much erroneous judgment upon the effect of remedies.

Membranous angina forms the subject of one lecture, and will serve as an introduction to diphtheria. The principal interest attaches to it from its great similarity to this disease, and demands notice because of the eminent authority which here testifies to the existence of a disease impossible to distinguish from diphtheria, except by its course; and which lays down the doctrine, that the presence of a membrane in the throat is not alone sufficient to form a diagnosis. In this, we believe, he differs from writers in our language generally.

Under the name of membranous angina [*angines couenneuses*], a name which he deems "excessively vague," may be comprehended a considerable number of affections, having a membrane as a common element, arising from the great proneness of mucous membrane to cover itself with fibrinous exudation when inflamed, excoriated, or cauterized with solid nitrate of

silver and the stronger acids. Cantharides is particularly mentioned as a remedy, which, when applied to the mucous surfaces, produces an exudation identical in appearance with that of diphtheria, and distinguishable only by the fact that the one remains circumscribed and soon disappears, while the other persists and spreads. He mentions also a scarlatinal membranous angina, and a mercurial, "too often confounded with syphilitic." But the disease in question is none of these, which are complications of other diseases, or the effect of direct applications, but is distinguished as simple, or "common" membranous angina. The anatomical element is, originally, *herpes of the pharynx*, the herpetic eruption, only discernible when the case is seen early and under very favourable circumstances.

The treatment of the disease is of the simplest character, and merits no attention; the whole interest of the subject hinges, as before said, upon the question, whether there is really a *membranous* disease of the throat, independent of complication, which is *not* diphtheria. Carefully reading his description of the disease, weighing his points of diagnosis, and duly considering his admissions, we cannot think the author has made out his case; not, at least, clearly enough for a practical consideration at the bedside. Were it not that in his description of diphtheria, he plainly makes two classes, the mild or benignant, and the malignant, and for his views as to the different origin of the two diseases, we should call this form of disease, as we certainly should such cases in practice, examples of the mild form of the more severe malady.[1]

The more distinctly marked character of the febrile symptoms and of pain in the throat, etc., which ushers in the milder disease—the simple membranous angina—are much relied upon as distinguishing it from diphtheria. Yet this latter disease, we are very certain, varies much as to the intensity of its initial symptoms, and it is only "sometimes" that it presents that insidious character, in which the patient is near death before professional advice has been called for.

Engorgement of the submaxillary glands is given as a point of differential diagnosis; "the submaxillary glands are swollen, but only moderately so, and far from what we see in diphtheria, where, in certain circumstances, the engorgement is very considerable. In common angina palpation alone enables us to discover it." But upon this point an eminent English writer differs with our author, and distinctly states the difference of opinion, even when the existence of the two diseases is not under consideration, but merely in describing to students the frequency and extent of ganglionary implication.[2]

The duration of the general symptoms for a few days before the appear-

[1] "Cases characterized, it is true, by more or less diphtheritic exudation in the fauces, but unattended by any urgent symptoms, form a large proportion of every epidemic. Sometimes it even happens that almost all the cases in particular epidemics are of the mild kind. Such cases usually recover under any rational mode of treatment, and it is the consequent great apparent success in treating them which has, sometimes, led even honest and worthy practitioners to promulgate as a specific for diphtheria some medicine with which they have treated large numbers of cases; the truth being that by far the greater proportion of these cases required only common care, and would probably have recovered without any medical treatment at all.—*Clinical Lecture on Diphtheria.* By ED. HEADLAM GREENHOW.

[2] Diphtheria: its Symptoms and Treatment. By WM. JENNER, M. D., Prof. of Clinical Medicine, University College; Physician to Hospital for sick Children, etc. London, 1861.

ance of the eruption is another point, and again he is at direct issue with the author just quoted, who says, "You may often suspect that the disease is diphtheria before the exudation occurs; and sometimes may be almost certain that it is so; just as in measles or scarlet fever you may venture on a diagnosis before the anatomical character of those diseases, *i. e.*, the eruption, has appeared."[1]

When the case is seen early the herpetic eruption can be seen, or when it is present at the same time on external parts of the body, the diagnosis is easy, but generally, under the circumstances of daily practice, it is difficult, if not impossible, and the disease is very frequently confounded with diphtheria, the evil results of the error being a loss of time in attacking the graver malady, and an overweening confidence in remedies engendered in the mind of the physician who has met with only the simpler malady, a confidence which produces disastrous results when he comes in contact with diphtheria itself.

He admits that this common membranous angina prevails epidemically, but with far less mortality than diphtheria; that it occurs, interspersed with diphtheria, when this is raging; that it becomes frequently the "point of departure," or, in other words, degenerates into diphtheria, and quotes illustrations and examples from his own reports made to the Imperial Academy of Medicine in 1859.

In what, then, does he find the necessity for making two diseases of groups of symptoms so similar? In their intimate nature, or, rather, in the nature of the *cause* which produces them. One is a simple and local disease, although sometimes epidemic, more generally sporadic, the membrane being a non-essential epiphenomenon; the other a general disease, of specific character, propagating itself by contagion, and of which the membrane is an essential condition.

"The notion of the morbific cause, and I shall insist upon this point in treating of specificity, can alone serve as a basis for the formation of species in pathology; for we cannot build upon the knowledge of the symptoms, essentially mobile, fugacious, and common to a great number of morbid species, nor upon the lesion, although this offers something more stable and less equivocal. If in some cases the lesion appears in effect, I will not say to constitute, but to characterize the disease, often it cannot be given as the essential character. On the one hand, it may be entirely wanting, as in scarlatina, measles, and variola without eruption; on the other, either very different lesions are met with in the same disease, as in syphilis, or similar organic changes appear in the course of maladies the most opposite in nature."

This opens upon us the whole subject of the specific characters of many diseases [*spécificité*] to which the author devotes a lecture in another part of the volume. It is a subject to a correct understanding of which he attaches a very great deal of importance, returning to it again and again, stating his belief that it "rules all pathology, all therapeutics, in a word, the whole practice of medicine." We should judge such marked inculcation of this doctrine more necessary in France than here, for we are told that the doctrines of Brown and of Broussais still exert an influence upon the professional mind there, and still find expression in medical language, although it is claimed that their yoke is shaken off. He gives a very interesting sketch of the "dichotomous doctrines" of the two great teachers and leaders, the one based on incitability and the other on irritability, in both of which diseases differed almost entirely in *degree*, scarcely at all in *nature;*

[1] Op. cit., p. 60.

a doctrine which reduced therapeutics to a simple matter of administering one class of remedies. A great deal of what he writes upon this subject is worthy of reproduction, but we have only space for a few extracts of historical interest, as connected with our subject.

* * * "However opposed these doctrines were to each other, they rested upon a common basis, for Broussais, while he was the greatest antagonist of Brown, nevertheless derived the principles of *physiologism* from the pathological system of the Scotch reformer, whose *incitability* differed only by its abstraction from the *irritability* of Broussais."

"Life, said Brown, is only maintained by *excitants;* life, said Broussais, is only maintained by *stimulants*."

"Disease consisting, according to the Edinburgh doctrine, in a greater or less degree of incitability, and according to the theory of the Val-de-Grace in exaggerated, or more rarely in diminished irritability, these dichotomous doctrines, essentially opposite, take account only of the quantity of the morbific cause, and absolutely not at all of the quality. Therapeutics founded upon such systems should be necessarily extremely simple. Thus, for Brown it was limited to the class of excitant remedies, and, in some very rare cases, antisthenics, if the term be permitted me; while Broussais had only recourse to antiphlogistics, and if he advised excitants it was in very exceptional circumstances.

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"This was to make, as completely as possible, a clean sweep of all nosology and of all materia medica. Matters were in this condition at the commencement of this century; this doctrine, so seducing at first by its simplicity, had gained many adherents when Laennec and Bretonneau appeared and gave each in his turn a blow, the severity of which Broussais sought in vain to conceal. Laennec, under the modest title of a semiological discovery, and seeming to limit his observation to the study of diseases of the respiratory system, wrote a marvellous chapter of nosology, while in his *Traité des Inflammations speciales du Tissue muqueux*, Bretonneau effected for acute diseases the restoration which Laennec had made for chronic.

"Calling attention to the primordial fact that differences in the nature of the cause impress upon diseases differences far more radical than can the greater or less intensity of this cause, the illustrious physician of Tours overturned from turret-stone to foundation the grand edifice of *physiologism* and of the pretended *rationalism* in therapeutics, and upon its ruins he erected the doctrine of the specificity of diseases.

"In physiology he gave to the special properties of the various tissues and the various organs an importance far greater than he accorded to the modifiers of the organism; in pathology he recognized that a great number of diseases have a common element, called irritation or inflammation, but this common element has not the importance assigned to it by Broussais. Without doubt the furuncle and the malignant pustule, the syphilitic chancre, and herpes preputialis, gastric derangement, and dothinentérite, have inflammation for a common element, characterized by fluxion, by redness, when the tissues are accessible to sight, by pain, and by elevation of temperature; but in addition to this common element there are others of well-marked character which distinguish these different affections, and which are of very considerable importance."

He pursues this subject at great length, but in a manner which could not tire any reader interested in his profession; he points out analogies between these views of disease and the facts in regard to plants and animals; gives abundant illustrations from pathology, and makes very numerous practical illustrations. We have space for only one more extract applying directly to the class of diseases under consideration:—

"An individual presents himself to you affected with sore throat; he was taken in the evening after a chill with general indisposition, backache, loss of appetite, and fever. The following day he complains of difficulty of swallowing, the submaxillary glands being but slightly engorged. Upon examining the

pharynx you find tumefaction of the tonsils, redness of the arches and veil of the palate, and upon the affected surfaces you see secretions having all the appearance of a false membrane. Suppose that at about the same time you are called to another patient also affected with a membranous angina, but in whom the affection has been differently developed. Without appreciable cause there has been for some days general indisposition without fever; his sore throat is much less painful than that of the first. If you take account only of the anatomical element common to the two affections, they resemble each other perfectly. The scalpel, the microscope, chemical analysis, would show you that in the two cases the false membranes are identical; to judge from appearances your second patient is far less ill than the first. But if you abandon the two to themselves, you will see the one, that which began with the more violent symptoms, with more pain, with a febrile reaction which was wanting in the other case, you will see, I say, this angina recover rapidly and spontaneously, and leave no trace of its existence; while the other will destroy the patient, who will succumb to a general poisoning, or to suffocation produced by the development of pseudo-membranous laryngitis or croup. In these two cases you have to deal with a membranous angina, but with this difference, that the one was the common kind, herpes of the pharynx, which is generally of little gravity, while the other was the malignant membranous angina or diphtheria, which is, on the contrary, generally grave."

And it is a knowledge of this difference in the essential nature of disease, this hidden something which we know not, but the presence of which is called *specificity*, which he believes of such importance as to sway all therapeutics and the whole of medicine; it is, of course, intimately connected with, indeed a part of, the natural history of diseases, and no opportunity of impressing the value of a thorough acquaintance with this is anywhere omitted in the work.

Diphtheria is a contagious disease, *specific par excellence*, which prevails in all climates and at all seasons, and spares no age, although children are its especial subjects; its anatomical manifestation is a false membrane produced on the mucous membranes, and on the skin if denuded of its epidermis; the pharynx is the most frequent seat of the membrane, whence it spreads to the larynx, producing croup; the most common fatal termination of the disease being by the suffocation thus produced, although malignant diphtheria may kill by a general poisoning, as do other septic diseases.

The first point to engage our attention is the fact that he makes diphtheria and croup identical, a point upon which he differs again from the latest and best English writers.[1] His lectures are entitled "Diphtheritic Angina *and* Croup;" they are the same disease only as respects the location of the membrane, and that generally, in all cases of croup, the formation of the membrane began in the pharynx, and extended thence to the larynx; therefore the croup is secondary, and not primary; it is not "*croup d'emblée*," to use his own expression, a term which has been made familiar to all from its use by writers on venereal diseases in regard to bubo. In this respect the pupil follows his master, Bretonneau having taught the same doctrine; but he mentions Guersant, so many years surgeon to the Children's Hospital, as one who formerly held the generally received view, but changed as soon as his attention was called to the subject, and says "it has been the same with all, as well in Paris as elsewhere, who have taken pains to investigate the matter." Meantime—

"I do not deny the existence of croup *d'emblée*. Not only do I not deny that the pellicular disease may begin in the larynx, but I admit that, in very rare

[1] Aitken: The Science and Practice of Medicine, 3d ed., 1864. Jenner, op. cit.

instances, it may attack the bronchial tubes first of all. Guersant and many others have cited examples. According to the report of Dr. Yvaron, in an epidemic which prevailed at Avignon during the year 1858, this primary laryngeal and bronchial diphtheria was the form it peculiarly affected. I have already recalled to your minds two cases in which the membrane appeared simultaneously in the bronchiæ and the trachea, as well as in parts accessible to sight. * * * I do not deny, then, that croup may begin in the larynx, but I maintain that the fact is rare and exceptional."

Why the membrane is not generally seen in the pharynx, in cases called and treated as croup, is, first, simply because it was not looked for, and, second, because the physician is called too late, when the membrane in the pharynx has disappeared. He distinctly teaches that the false membrane may form in the pharynx, exist there one or two days, pass on to the larynx, leaving its original location entirely free, the slight intensity of the general symptoms favouring the oversight of practitioner and friends.[1]

"When you are called to a child which you are told has been suffering with croup for two days only, question the parents, and you will learn that the child has been suffering a longer time; that for five or six days he has not eaten well; that he has complained of some difficulty in swallowing; that he has refused food somewhat hard, as crust of bread; you will learn also that there has been some swelling of the neck; these are the certain indices of a sore throat, and of the past existence of false membranes which you can no longer see."

This is not limited to children, but the same is true of adults, and in them even more likely to occur and to prove disastrous, the reason given being that in them the opening of the larynx is proportionally larger and the calibre of the trachea greater, whereby the air finds sufficient passage without exciting difficulty of breathing, even after the air-tubes are lined with false membrane. The following case is given in illustration of this fact; it also shows the insidious approach of the disease, and an amount of resource and promptitude of action on the part of the author sufficient to qualify him for a backwoods practitioner, and we consider this no mean compliment:—

"I was one day, a day too memorable for me ever to forget, dining with a friend whose chateau is situated a short distance from Silles, in the department of Cher, when a peasant came for me in great haste for his wife, who, he said, was suffocating. I went to her immediately. I found a woman of twenty-six years, still clothed in her holiday garments; it was Whitsunday. She had been to mass in the morning, more than a quarter of a league from there; after returning on foot, she had dined as usual, and was even preparing to go again to vespers, when she was taken all at once with an attack of suffocation so violent

[1] Since this article was prepared for the press, the writer has seen two cases supporting the views of the author in this respect. In one, a boy of ten years of age, seen in consultation, the membrane had entirely disappeared from the throat under the treatment and observation of the attending physician when the croupy symptoms set in; and had the history of the case been wanting, there was nothing to indicate that it was a case of diphtheria. In the other patient, a little girl four years old, the membrane disappeared from the throat, all symptoms passed away, and attendance was discontinued for two days, although a preparation of iron was continued; symptoms of invasion of the larynx then came on, and proved fatal in a few days.

In both of these cases tracheotomy was considered, and not advised; in the first, because it was believed the membrane extended too deeply, an opinion proved to be correct by the expulsion on two occasions of membranous casts of the trachea several inches long; in the other, because of the evidence of a too profound blood-poisoning, the membrane reappeared on the throat, extended forwards over the palate, and even appeared on the gums.

that her husband feared we should find her dead upon our arrival. She was in effect expiring when I saw her. Examining her throat immediately, I discovered thick false membranes covering the pharynx. The nature of the disease was plain to me, and this poor woman being in the last extremity, tracheotomy alone could rescue her from immediate death. Without delay I set about performing it. I was alone, with no assistant but the husband, with no instrument but a penknife with a convex blade, which fortunately I had with me; then I was obliged, for want of a tracheal canula, to make a rough one of a leaden ball which I flattened with a hammer and fashioned into a sort of a tube. Unhappily the false membranes had already extended to the small bronchiæ, and the patient died the following day."

It is needless to follow the author in detail through the consideration of each individual symptom of the disease—of the two diseases, we should say, for croup is given as fully as diphtheria. We cannot omit, however, to transcribe the painful picture of the closing scene of croup, so faithful to the sad reality, and which has been thought worthy of quotation by other writers:—

"Meanwhile the attacks of suffocation occur nearer together, and become more and more violent, and up to the moment of dissolution there are soon no more intervals of tranquillity between them; the laryngeal whistling is continuous. From time to time the poor child, in a state of agitation impossible to describe, springs up into a sitting posture, seizes the curtains of its bed, which it tears in its movements of convulsive rage; sometimes it tears with its nails the paper from the walls; it precipitates itself upon the neck of its mother, or of the persons who surround it, seizes them, seeking to grasp everything within its reach, and find wherever possible a point of support. The next moment it is against itself that its vain efforts are directed, clutching violently at its neck, as if to tear away the obstruction which suffocates it. The face is swollen and of violet hue; the eyes haggard and brilliant, expressing the most painful anxiety and the most profound terror; then, overwhelmed with its sufferings, the child falls into a sort of stupor, during which the respiration remains difficult and whistling. Its countenance, its lips are then pale, its eyes dull. Finally, after a supreme effort of respiration, the agony begins, and the struggle terminates without there being, from this time, as severe an attack of suffocation as many which have heretofore occurred, and in which death might have been expected."

The *prognosis* of diphtheria is decidedly bad; he believes it to be almost universally fatal if uninterfered with by treatment, and gives abundant illustration of the truth of this statement. The frequency with which recovery takes place by the spontaneous expulsion of the false membrane is a point to which we turned with great interest; the author has only met with *six cases* during his long and extensive practice! The fact that such expulsion has an unfavourable influence upon subsequent tracheotomy is one not apparent, but has been learned by experience.

"It is a remarkable fact that, although the expulsion of the false membrane incontestably affords to the patient a chance of recovery, it affords less when, the recovery not following spontaneously, we are forced afterwards to perform tracheotomy. In a word, this operation is less likely to succeed in a child which has expelled false membranes than in one which has not. You will see the reason for this immediately.

"The presence of pseudo-membranous concretions in the larynx and in the trachea proves that the diphtheritic inflammation has gained these organs. After tracheotomy this propagation seems to cease. Now the expulsion of the diphtheritic membranes, in postponing the time when we are forced to interfere, permits the inflammation to spread, so that in a child which has thrown up pseudo-membranous tubes by its efforts of coughing or vomiting, and which has experienced a temporary amelioration, putting off for forty-eight hours the necessity of operating, you run the risk of seeing the bronchial tubes invaded even

to their smallest ramifications; while in another child, upon which tracheotomy was performed early, before the expulsion of membranes, it will not be thus under ordinary circumstances."

Thus far the author has been treating of the milder form of the disease, the form in which it always appears when occurring sporadically, and by far the most frequent when it prevails as an epidemic. But there is another form, far more terrible by the rapidity of its course and its almost universal fatality. It is malignant diphtheria, from which the patient dies, as sometimes in cholera, overwhelmed by the fatal influence, without the disease running through its usual stages; "the general poisoning seems to take place at once, and when the characteristic concretions begin to appear upon the pharynx and in the nose, the whole economy is already profoundly altered." Fortunately this form is comparatively rare; from 1822 to 1844 the author did not meet with a case; within the few past years he has seen more than seventy in Paris alone.

As usual, in opening a new subject, the author details at length a case which has occurred in the hospital, commenting upon the treatment which has been conducted under the observation of the students. He makes two subdivisions of this form of the disease, into that which runs a *slow* and that which runs a *rapid* course. The case detailed belongs to the former. Of the second, which may be said to kill by "sideration," he gives the following sad instances:—

"One of the most deeply regretted colleagues of our hospital, whose name is widely known, and whose works are in the hands of many of you, Valleix, attended a child suffering from membranous angina. The disease, which was not very grave in character, was cured, thanks to the energetic treatment of our unfortunate brother. In examining the throat one day Valleix received into his mouth a little of the patient's saliva, expelled by its efforts of coughing; he took the disease. The next day he ascertained the existence of a small pellicular concretion upon one of his tonsils, a light febrile movement followed; at the end of a few hours both tonsils and the uvula were covered with false membranes. Soon an abundant serous discharge was set up from the nose; the glands of the neck, the cellular tissue of this region and of the inferior maxillary region became considerably tumefied; he was delirious; and in forty-eight hours he was dead, without having presented any laryngeal symptoms whatever.

"Very recently one of our professional brethren of the provinces treated a child with diphtheria and croup; he was obliged to resort to tracheotomy. During the operation blood entered the trachea, and suffocation was imminent; our imprudent confrère, affrighted, applied his mouth to the wound in the neck and drew the liquid out of the air-passages; he inoculated himself with the disease. Forty-eight hours afterwards, like Valleix, he died of malignant diphtheria, and like him, with delirium and the other accidents which I have just mentioned to you.

"What lamentable cases to receive additions! Yet in the same manner my colleague and friend, M. Blache, was so unfortunate as to lose his son, one of the most distinguished internes of our hospital, a young man to whom the future was full of promise, and in whom intellectual gifts were added to the most solid instruction. Henry Blache was placed by his uncle, M. Paul Guersant, in charge of a child upon which he had just performed tracheotomy for croup; he passed three nights with it. At the end of the third he experienced a slight soreness of the throat, returned home and made complaint to his father. Being immediately called, MM. Roger, Degroux, and myself, we found the unfortunate young man with a very intense fever, the tonsils covered with false membranes. In a few hours the swelling of the neck had become enormous, the nasal discharge was established and was incessant; at the end of the third day delirium set in; sixty-two hours after, in spite of the energy of our medication, we saw

our unfortunate patient die. He succumbed without having presented the least symptoms of implication of the larynx."

Truly science has her martyrs as well as religion.

Tracing the course of the slower form of the disease, he notices the points upon which it differs most markedly from the common form; they are a greater amount of ganglionic engorgement, often accompanied by an erysipelatous redness, a more rapid spread of the false membranes, and especially the presence of the diphtheritic concretions in the nose, a symptom always of the gravest import.

"At the end of twenty-four, thirty-six, or forty-eight hours the nasal fossæ are invaded. The existence of concretions in these cavities is a most serious fact, to which I called your attention when speaking of our little patient in the St. Bernard ward. Bear it in mind, gentlemen, for when it appears, even in the form apparently the most benign in the beginning, you will very rarely see the patient, either child or adult, recover. Of all the manifestations of the disease, I have said it, I repeat it, and insist again upon this capital fact, that which is shown on the olfactive mucous membrane is the most alarming. Of twenty individuals affected with nasal diphtheria, nineteen will succumb, while of twenty affected with croup, we can save a certain number by tracheotomy, as I hope soon to show you."

The gravity then of malignant diphtheria can scarcely be exaggerated; of the slow form some may be saved, although it is "more grave than typhus, than cholera, or than yellow fever." The other form is pitiless in its fatal course.

We must not omit to mention some facts he gives in regard to the *inoculability* of the disease. After stating its undoubted contagiousness, he says the possibility of transmitting it by inoculation is doubtful, but he rejects all experiments upon animals as being valueless in deciding the question. He then gives the following negative facts. But do they not illustrate the well-known truth that besides the *materies morbi* of contagion or inoculation there must be a certain condition of the recipient? The seed will not sprout if it does not fall in fertile soil. After the case of the provincial surgeon, already quoted, it would not seem necessary to repeat such experiments.

"I attempted, in 1828, to inoculate myself with the disease by puncturing the left arm, the tonsils and the veil of the palate, with a lancet dipped in a false membrane which I had just taken from a diphtheritic wound, and did not give myself diphtheria. In the excellent memoir of M. Peter, which I have often quoted to you, he states how he three times tried the same experiment upon himself, but without result. The first time, while performing tracheotomy upon a child, he received upon the cornea of the left eye a semi-liquid pseudo-membranous production which covered the organ for an instant, and of which the more fluid portion bathed the inside of the lids; he did not wash the eye, and no evil result followed. The second time he made three punctures upon the lower lip with a lancet covered with semi-fluid diphtheritic exudation, and he experienced no derangement of his health. The third time, finally, this daring experimenter brushed over the tonsils, the pillars and velum of the palate, and the posterior part of the pharynx with charpie charged with diphtheritic matter, and this time, too, the result was negative. It may be then, gentlemen, after these experiments, that diphtheria is no more inoculable than scarlatina and hooping-cough, diseases of which no one, however, doubts the contagious nature."

We pass on to the treatment of diphtheria and croup. First of all the antiphlogistic treatment is decidedly rejected, and the author seems more anxious to impress this point because the current doctrine having been that the local disease is inflammatory in nature it would seem rational that it

might be extinguished by bloodletting. But here again he brings in his doctrine of specificity. Inflammation there undoubtedly is, but depletion can no more stop its course than it can the inflammation which attends upon a pustule of variola. He says plainly that long experience has demonstrated to him that antiphlogistic measures are not only useless but injurious.

He rejects also alterative medication, an annex of the antiphlogistic. His remarks upon mercurials, the principal medicines of this class, and their double mode of action, cannot but be interesting, considering the high standing of the author as a writer upon therapeutics. It will be seen that he distinctly recognizes the power of mercury in controlling inflammation, a power which has been of late years repeatedly questioned and denied.

"Among the agents of alterative medication, mercury and its preparations occupy an important place. The mercurials, as you know, are considered the most powerful antiphlogistics of the materia medica, and perhaps their power is even greater than that of bloodletting. You have a hundred times seen the effects which we obtain with them in certain phlegmasiæ of the serous membranes; you do not forget that their happy influence over these inflammations, very grave by their extent, their seat, or by the febrile reaction excited, has been extolled. Well; the mercurial preparations, calomel given internally, the mercurial ointment applied to the skin, have been tried in England, in Germany, in America, and in France, under the name of antiphlogistics, in the treatment of diphtheritic affections—membranous angina and croup. The results, I must say, have been often happy. Without resorting to any other medication, calomel administered *fractâ dosi*, according to the method of Doctor Law, has cured a certain number of patients.

"This, gentlemen, would seem in contradiction with the proposition I have just laid down in regard to the dangers of the antiphlogistic treatment; the fact is, the question is a complex one. Calomel, and indeed the mercurial preparations are an *argumentum bis feriens*. Mercury has two modes of action: on the one hand it has a general action upon the economy, and in this respect it is an alterative, an antiphlogistic; on the other hand it has an action exclusively topical. When you prescribe lotions of a solution of corrosive sublimate to the skin, when you drop into the eye mercurial collyriæ, or apply to the lids preparations of red precipitate or of the mild chloride, when you fumigate with cinnabar, your treatment is exclusively local, and it is only indirectly that you obtain general effects; you are applying substitutive medication. It is only later, only by persevering in this treatment that the mercury acts upon the composition of the blood and modifies it, as do all alteratives. Now, so far as it acts as a topical agent the protochloride of mercury appears to me to be of real utility in the treatment of diphtheritic affections. Applied to wounds which are the seat of pseudo-membranous exudations it modifies them advantageously, and if it has rendered any service in diphtheritic angina, it has been by acting in the same manner. When it is administered in fractional doses (five centigrammes, gr. .77, mixed with four grammes of sugar, and divided into twenty powders, one to be taken every hour), to an individual suffering with diphtheria, it goes mixed with the saliva, to traverse the pharynx, touch the affected surfaces and modify them as it modifies wounds upon the external surface. I do not deny, however, the general action which may follow; absorbed from the digestive passages it produces considerable effects; it modifies the blood by augmenting its fluidity, and puts it in such a condition that the secretions are less plastic than they were before. So little do I contest this general action that I dread it, and the topical action appears to me alone useful. In truth, when we limit ourselves to repeated mercurial frictions we bring about very quickly this peculiar dyscrasia of the blood, we determine the phenomena which depend upon it, we produce salivation, and meantime, in these cases, we do not cure the angina. Further, by reason even of this general action upon the economy the mercurial treatment has its dangers. Its effects varying according to individual predispositions we run the risk of seeing it pass beyond the limits to which we would restrain it, and in these circumstances we find again the disadvantage of the antiphlogistic

plan, which, if it does not directly aggravate the malady, prolongs convalescence by augmenting the debility into which, I repeat, the patient will be thrown by the very existence of his disease."

The bicarbonate of soda having been advanced as a specific for this disease, its claims are examined and its value as a remedy, to say nothing of specific power, is denied.

The chlorate of potash is a medicine of more importance and character. He sketches its discovery, its introduction into practice, its fall into forgetfulness and its revival. He is very guarded in his expressions as to its value in diphtheria, and his conclusions far from justify the popularity of the medicine with us. Facts have seemed to favour its utility, but it is far from being a reliable medicine, and, if seemingly efficacious in cases of medium intensity, he denies its power over those of grave characters.

"When in these cases it has been exclusively employed, I have constantly seen it fail; employed conjointly with other medicines it has seemed, without it being possible for me to affirm it, to have an effect really advantageous. What I say of membranous angina applies even more strongly to pseudo-membranous laryngitis. Without doubt cases can be cited from time to time of croup cured by chlorate of potash; but these observations can never be convincing, for the reason that generally the medicine has been associated with others, particularly with emetics, which of themselves will sometimes explain the success. However, as this medicine has the reputation of exerting a general influence upon the organism and opposing the reproduction of plastic exudations, as none of the disadvantages attach to it which I have mentioned as belonging to the alkalies and the mercurials, there is nothing against having recourse to it in so dreaded a disease. Guard, however, against having too much confidence in its virtues; guard, above all, against employing it to the exclusion of other remedies, the efficacy of which has been demonstrated by experience."

Bromide of potassium and bromine are next considered; they have been recommended highly, but by one who "in his practice follows a way which is not ours, and which, therefore, compels doubts;" nevertheless he recommends a trial of these medicines under proper circumstances.

Sulphuret of potash and the polygala senega have both had their day of popularity, but have both been abandoned.

He next considers modes of treatment which may be termed indirect; they are *emetics* and *revulsives*. The former have two modes of action: an antiphlogistic, shown by the relaxed and depressed condition during the state of nausea as well as during vomiting; and a mechanical, clearing the air-passages of concretions which obstruct them by the efforts of retching. The former part of their action he of course considers injurious; the latter is, as far as it goes, beneficial. Emetics are not, however, very reliable in diphtheritic affections, in his opinion; their reputation has been gained in false croup, where their antiphlogistic action is sufficient to extinguish the inflammatory element of the disease, and he refers to Valleix's *Guide du Médecin Practicien*, for a confirmation of his opinion upon this point.

"But however useful the emetic plan of treatment may be in some circumstances, do not accord it too great confidence. After a tolerably long practice, after having seen a large number of patients, both children and adults, suffering from diphtheritic angina and croup, I can state that the failures of this plan very far outnumber the few cases of success I have witnessed. And even after having given emetics, and having obtained a notable amelioration of the accidents for which you prescribed them, never forget that these accidents will manifest themselves again; often, within a very brief space of time, the difficulty of respiration, the attacks of suffocation which you have caused to disap-

pear will appear again, because new false membranes will have been formed. If once again you are fortunate enough to cause their expulsion, a third time the same means will fail you, and take care that you do not, by too frequently producing nausea, throw your patient into such a state of depression that he can no longer struggle against the disease when it shall be necessary to have recourse to tracheotomy."

In regard to the revulsive plan of treatment, we will not quote his remarks at length, because we do not believe it is followed in this country sufficiently to make his reprehension necessary. He not only rejects blisters *in toto*, but ridicules the idea that they can possibly be of any service; as well blister the neck of a child into whose trachea a bean has passed; and not only this, but the tendency to the formation of false membranes on the blistered surfaces complicates the case, and adds to the chances against the patient's recovery. In connection with this subject, he quotes our countryman, Samuel Bard, as he does upon several other points.

He then arrives at *topical medication*, which he tells us is the treatment *par excellence* of diphtheria, notwithstanding much opposition which it has encountered. Astringents and caustics are the agents of this medication, and they have been employed from time immemorial. Aretæus used alum and powdered gall-nuts, and taught that the disease should be combated with remedies "similar to fire." Yet these remedies fell into forgetfulness; they were not used at all during the epidemics of the seventeenth and eighteenth centuries; and, singular to say, Bretonneau, "who knew better than any one what Aretæus had written of alum," thought but little of this astringent even at the time he published his *Traité de la Diphtherite;* it was not until he learned its powers from Trousseau himself, that he gave it his confidence; and then follows a most interesting account of the author's acquaintance with the remedy, which we should like to give in full, but must condense it. Briefly, then, diphtheria was raging in one of the departments, and he went to the seat of the epidemic to observe and study it. He there learned from the pastor that the disease had ceased to be as fatal since the patients had been treated by an innkeeper's wife, who had enjoyed a local celebrity as an eye-doctor. Her remedy was a secret, but Trousseau, visiting her patients, to observe the disease, soon found it to be a solution of alum in vinegar and water; she confessed its nature, and said she had used it because of its beneficial effect in a disease of pigs, characterized by white patches on the mouth, and the resemblance of this disease to diphtheria had suggested the use of the same medicine.

"I communicated my documents and the facts which I had observed to the prefect of the department; this mode of treatment was published, and sent to the different communes; I also gave an account of what I had seen to Bretonneau, who has since then had recourse to alum, and it is now used by physicians everywhere."

Tannin is another medicine, used by Aretæus as powdered galls, which the author used in almost every case, sometimes alternating it with alum, and he applies them in the selfsame way followed by the ancient physician; they are blown into the throat through an elder-tube or a roll of paper, the insufflations being repeated every two, three, or four hours.

The author has so much confidence in this astringent medication, that he would not resort to any stronger local applications, could he be always sure of their thorough application and of his directions being followed. Passing on to caustics, however, the first he mentions is chemically pure muriatic acid, applied three or four times during the twenty-four hours.

It is preferable to the nitric or sulphuric acid, because its action does not extend beyond the part touched any more than does nitrate of silver; it has, however, one inconvenience; it produces upon the mucous membrane to which it is applied a membrane so similar in appearance to the diphtheritic exudation as to be scarcely distinguishable from it.

The solid nitrate of silver has been more frequently used than any other caustic since Bretonneau popularized its use. It is liable to the same objection as muriatic acid; an objection which is obviated by using the solution, which the author therefore prefers, of the strength of one part of the chemical to three of water; with the solution is also gained a far wider range of application, up behind the veil and arches of the palate, down to the epiglottis, and the opening of the larynx.

A saturated solution of sulphate of copper is also used in the same manner.

All these remedies find their application in croup as well as in pharyngeal diphtheria:—

"A child begins to have a croupy cough; he has not the croup yet; the pseudo-membrane is not yet formed in the larynx, there is only a commencing diphtheritic inflammation, but before twenty-four or forty-eight hours have passed away the false membrane will exist; the point is to prevent its production by modifying the diseased action which gives origin to them, by the application of caustics carried to the superior orifice, or even into the interior of the larynx itself."

Bretonneau and the author blow in alum continuously until the child forced to make a deep inspiration, draws the powder into the air-passages Caustics are also applied by the sponge probang. To the plan of cauterizing the larynx proposed by Dr. Green, of New York, the author prefers that of his countryman, Loiseau, which was first used by Dieffenbach, at Berlin. The forefinger of the left hand is armed with a metallic fingerstall which leaves the ungual phalanx and last articulation free; this finger is then introduced into the throat, the epiglottis is raised, and caustics can be applied by injection, insufflation, or by the saturated sponge. Favourable testimony is given of this plan, but evidently the author has not personally followed it to any great extent.

Perchloride of iron is another remedy for which specific power over diphtheria has been claimed. The virtues which have been claimed for it cannot be accorded; meantime it has rendered good service as a caustic in concentrated solution to parts covered with exudation, and internally; in the latter way its great solubility gives it an advantage over other preparations of the same metal.

But local treatment is not all; there is, as well, a general treatment.

"This treatment should be essentially tonic and reparative, as in all diseases where the powers of the economy seem to be primitively troubled and depressed. *Alimentation* here occupies the first rank, and the graver the disease the greater necessity for the nourishment of the patient. One of the most alarming signs in regard to prognosis is want of appetite, the distaste for every kind of nourishment. We must seek to overcome this by all means, and, in order to succeed, I do not hesitate to resort sometimes, in the case of children, even to threats. So long as the appetite is retained there are great chances for recovery. There can be nothing fixed in regard to the selection of aliments. We are often obliged to satisfy the strangest caprices of taste. When in diphtheria there is difficulty and pain in deglutition, I give the semi-solid substances, thick soups, pulpy substances, chocolate, cream, eggs, etc., and, as soon as I can, proceed to more reparative animal nourishment.

"The pharmaceutical agents which I make use of are the preparations of cinchona and of iron. I give generally the powdered yellow bark, in the dose of one to two grammes [gr. xv—ʒss] in a cup of coffee, so as to cover its bitterness and facilitate its ingestion. For those who cannot take this preparation, and when I wish to obtain a more prompt effect, I substitute the sulphate of quinia for the powder of cinchona, given in the same way, in coffee. I give also the wine and the syrup of cinchona.

"As to the ferruginous preparations, I choose the more soluble; the perchloride, of which I have just spoken, the syrup of the citrate, or of the tartrate of iron."

All medical means having failed, tracheotomy yet remains for those cases in which the membrane has extended to the larynx, or, according to the doctrine generally received by us, those cases in which it formed only there —membranous croup. We turn to what the author has to say upon this subject with an interest commensurate to the part he played in introducing the operation and to his experience with it. In his historical sketch, containing a long record of unsuccessful attempts, he accords the honor of the first certainly successful case to his master, Bretonneau, and claims the second for himself. This was in 1833; since then he has operated more than two hundred times with success in more than one-fourth of the cases. In one of the Parisian hospitals, he states the successful cases at more than one-fifth; a fair result, considering the social condition of those who apply there for relief, the malpractice the patients have experienced from injudicious friends, and the advanced stages of the disease in which many of them are brought in. In private practice he thinks that one-half of the patients operated on should be saved, and claims that it offers so good a chance for the rescue of life as to make its performance a duty, and not a matter of choice.

With an apology to the surgeons, he describes the instruments and the steps of the operation, "an operation which physicians are more frequently called upon to perform than surgeons."

The instruments are a sharp and a probe-pointed bistoury, two blunt hooks, a dilator, and the double canula. The dilator resembles a pair of curved dressing-forceps with extremities bent outwards, and is used to open the wound in the trachea and facilitate the insertion of the canula; he considers it indispensable, having lost but one case under the operation, and that he attributes to the want of this instrument; blood flowed into the trachea during the efforts to introduce the canula, and suffocated the patient before the difficulties could be overcome.

The different steps of the operation do not differ from those ordinarily described in the text-books; the following remarks are, however, too important to be omitted:—

"I cannot insist too strongly, gentlemen, upon the necessity of dividing the tissues layer by layer, of drawing away the muscles and the vessels with the blunt hooks, of well baring the trachea before opening it; I insist upon the absolute necessity of operating *very slowly*. If even during the operation the child suffocates, stop a little while, allow him to struggle, let him up on his seat, and give him time to catch his breath. This will be perhaps a minute or two lost, but there is nothing to fear. I have never seen *too great slowness* cause an accident, and I have often been a witness of the difficulties and the dangers of a *too rapid* tracheotomy, even when performed by a skilful operator.

"I oppose, then, with all my power, the rapid mode of operating recommended by M. Chassaignac, which consists in fixing the larynx by means of a tenaculum, and penetrating the trachea directly by a thrust which passes at once through the skin and the deeper parts. [Here follows a historical sketch of this mode

of operating, with mention of its adherents and opposers, from the time of Sanctorius (1586) to the present time.] Paul Guersant once followed the speedy method; but now, although he operates more rapidly than any of us who are not surgeons, he proceeds slowly enough to avoid the grave risks which I will mention to you. On the one hand, there is danger in fixing the larynx, for, in opposing movements upon which depend the exercise of a function already seriously compromised, you run the risk of accelerating asphyxia and death; on the other hand, you are likely to occasion fatal hemorrhage should your instrument, by chance, come in contact with arteries abnormally distributed, as occurred in a case communicated to me by M. Richet. In a little girl upon whom he operated for croup, just as he was about to open the trachea, he was obliged to divide an artery almost as large as the radial; it was an anastomosing branch of the two inferior thyroids. A ligature applied to the two extremities arrested the hemorrhage, and on this occasion this skilful surgeon had once more to felicitate himself upon the slowness with which he habitually proceeds in tracheotomy. In another case I found the left carotid arising from the innominata and crossing the trachea. Further, not only is it less easy to puncture the trachea through the skin than at the bottom of a wound, but the instrument may deviate and enter the œsophagus instead of the air-passage, as once happened to our colleague, A. Bérard. Finally, if, at the moment the canula is introduced, a false membrane lining the trachea opposes an obstacle to this step of the operation, how are you going to seek for it through a narrow and deep wound? how can you see it in the midst of the blood? Death will be then inevitable."

In illustration, he details an interesting case in which a false membrane was pushed down before the entering canula, and produced symptoms of immediate suffocation, when, happily, it was seized and withdrawn.

There are some points of the after-treatment to which he attaches very great importance; if too much stress appears laid upon them, he apologizes by saying, "The more I advance in age the more I am convinced that in therapeutics the minutiæ hold a far more considerable place than is generally believed." The principal of these is the surrounding the neck and canula with some knitted woollen fabric, so that the patient inspires air warmed and moistened by respiration.

There remains the question of after-treatment:—

"This subject, entirely medical, is so important that it henceforth rules everything, and while some lose their patients almost invariably, others save a third or even half of them. I should do wrong to speak only of the treatment to be followed; we must also take fully into account that which has been prescribed. Let us say at once, for it is the truth, that the majority of physicians are now, happily, agreed upon the point that the general medications of which I have spoken to you are often useless; even that the chances of success will be as much greater as these medications have been less energetic; that, above all, vesicatories have the great evils which I have pointed out to you: the result is that they do not exhaust their little patients by bloodletting, that they take good care not to apply blisters. For my part, I am firmly convinced that if we have been more fortunate with tracheotomy during a certain number of years past, it is due to the better direction of the preceding treatment instituted by our confrères. * * * * * * * * *

"The operation performed, the first thing to which the physician should direct his attention is *alimentation*. I have, gentlemen, several times insisted upon this point; alimentation is the remedy *par excellence* in the majority of acute diseases, and above all in the diseases of children. It is certain that abstinence, prescribed by Broussais, and still adhered to by a great number of physicians who, not being able to shake off the old man, retain too many prejudices of their early medical education, abstinence is one of the gravest complications of diseases, the best calculated to maintain the infected condition of the economy, the best calculated to favour the absorption of external miasms, and of vicious secre-

tions produced in the system, the most contrary to that power of resistance which is the great moving force of convalescence and of definite cure. I do not say that it is necessary to gorge the little patients with food; I only say that it is necessary to satisfy their appetite if they have any, and to force them to take food if they will not take it otherwise. * * * * *

"What I have just said indicates that I proscribe, in the most formal manner, a continuation of those means which, before the operation, were judged more or less appropriate—calomel, alum, emetics, and purgatives—which could not be compatible with the alimentation which I advise."

Then follows the statement of a "remarkable fact," which seems to us additional evidence that croup is not always merely laryngeal diphtheria; for if so, and if diphtheria be a general disease, why the difference between its external, or cutaneous, and internal manifestations?

"A remarkable fact is that tracheotomy once performed, no further attention need be bestowed upon the pharyngeal or laryngeal manifestations which before demanded such vigorous treatment; they cure themselves. It seems as if the disease, having arrived in the air-passages, had exhausted all its powers, and as if, in giving inlet to the air by tracheotomy, the patient be prevented from dying, the cure would follow naturally. I speak of the pharyngeal and tracheal manifestations, for the cutaneous manifestations should be still most thoroughly treated by the topical measures I have indicated, under penalty of seeing them become the occasion of unhealthy absorption and of a general infection which should be prevented at every hazard."

Having completed at very considerable length the details of dressing and of after-treatment, he arrives at the important question of the best time for the performance of the operation.

"I wrote, in 1834, and repeated, in 1851, 'So long as tracheotomy was an unreliable measure in my hands, I said operate as late as possible, but now that I can rely upon a fair prospect of success, I say operate as soon as possible.' In removing from this statement what may appear too absolute, I still maintain the proposition in saying that *the chances of success of the operation are great in proportion to the early period at which it is performed.* The ingenious experiments of M. Faure have demonstrated that in slowly and methodically asphyxiating an animal, clots form in the heart and great vessels during the last moments of life; the operation should therefore be performed before death is imminent; but I hasten to add that, at whatever degree the asphyxia may have arrived, the child having but a few minutes to live, tracheotomy should be performed; it has a chance of success *when the local lesion, when the croup, constitutes the principal danger of the disease.*

"This restriction is important, for if the diphtheritic infection have profoundly affected the economy; if the skin and the nasal fossæ are attacked by the specific inflammation; if the frequency of the pulse, the delirium, and the prostration indicate a profound poisoning of the system; if, in a word, you have to deal with the malignant form of diphtheria in which the peril is rather in the general state than in the local lesion of the trachea or larynx, *the operation should not be performed;* it is invariably followed by death."

The predominance of the symptoms of asphyxia over all others are at once the guide to the operation and the conditions of its success.

Finally, there is the influence of age upon the success of tracheotomy. It is less likely to prove successful in adults than in children, for reasons already given; in infants it offers but little chance of saving life; the author has seen but two successful cases under two years of age, one at thirteen months, the other at only six days less than two years. He reports some few other instances of success under the second year, but such cases are rare. He still thinks, however, that the patient should have whatever

chance the operation affords without reference to its age, except, of course, in regard to prognosis.

With this we must close the subject chosen for examination. But it would be injustice to the author if we did not state that we have not touched upon many points of interest which are fully considered by him. The state of the blood, the diverse localizations of diphtheria, albuminuria and diphtheritic paralysis are some of the most important. The latter is one of the most interesting subjects connected with the disease, and its consideration occupies twenty-six pages of the work.

We must also close our review. We should, perhaps, have more fully attained the object of such an undertaking had we viewed the work more as a whole, examined it more critically throughout, and compared it closely with other works of similar aim and character. This we should have done had it been in our own language, and accessible to those who read our remarks; as it is not, we have thought the interest of our readers best subserved by presenting brief portions of the work, and the object of giving information as to the book and its author best attained by extract rather than by comment. If we have confined our attention too much to a limited portion of but one of the three volumes, our apology will be the better opportunity afforded for individual judgment by a pretty thorough presentation of his mode of dealing with one class of diseases, and an acquaintance with the author himself, as direct as the medium of translation will allow.

We close our task with regret. It is not often that such a work, by such a man, is presented to the medical world. The crowning effort of a lifetime of labour in the pursuit of the best means of curing disease, the production of an acute observer, an untiring worker, an experienced teacher, and a talented writer, it stands a shining light in medical literature, and a lasting monument to the fame of the author, rivalled only by such works as those of his great model Graves, or of his countryman, Andral.

J. C. R.

ART. XVI.—*Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine.* By WILLIAM ADAMS, F. R. C. S., Surgeon to the Royal Orthopædic and great Northern Hospitals, &c. &c. Delivered at the Grosvenor Place School of Medicine in the Session 1860–61. Illustrated by Five Lithograph Plates and Sixty-One Wood Engravings. 8vo. pp. 334. London: John Churchill & Sons, 1865.

THE subject of *lateral curvature of the spine* is one of great practical importance. It is of frequent occurrence, and its results are serious. It not only produces deformity, but it impairs the general health of the patient, either by causing pain or by interference with the functions of the important organs contained in the thorax and abdomen.

This volume of Mr. Adams contains a revised course of seven lectures, delivered in 1860–61, and published shortly afterwards in the *Medical Times and Gazette*, together with four lectures, hitherto unpublished, which have been added in order to render the subject more complete in all its details. The main object of the author is to establish the treatment of spinal curvature upon a more exact knowledge of its pathology. His

work differs, therefore, from most others upon this subject, inasmuch as it has not been written for the purpose of bringing into notice, or of eulogizing some particular mode of treatment.

As a correct knowledge of the pathology of a disease is the only sure foundation for the proper treatment, and as Mr. Adams has well accomplished the main object he had in view in this work, more satisfactorily, we believe, than any other writer on the subject, we purpose to lay before our readers a full analysis of his volume.

The first two lectures contain some general observations upon the subjects of the book, and a sketch of those peculiarities in the anatomy and the physiology of the vertebral column which have a special interest in relation to the production of lateral curvature. There are some points in respect to the anatomical construction of the spine in which Mr. Adams differs from most anatomists. He doubts the existence of a lateral curve in the dorsal region as a normal condition of the spine, and the normal antero-posterior curves are stated to materially weaken the vertebral column. As is well known, a curve is described by anatomists, situated at the level of the third, fourth, and fifth dorsal vertebræ, and is attributed generally to the presence of the aorta. Mr. Adams opposes this almost universal belief, not only from examinations of the living but from numerous and careful observations on the dead subject, a better test, insomuch as in all lateral curvatures of the spine the deviation of the bodies of the vertebræ is much greater than that of the spinous processes. This point in anatomy is important, as a belief in the existence of a slight lateral curvature as a normal condition would lead, in a particular case, to an unsound opinion in practice. Of this Mr. Adams has recorded an example at page 25. This matter can only be determined by very accurate anatomical investigation. That the spine is weakened by the antero-posterior curves seems to us questionable, for it is demonstrated in physics that of two columns, equal in all other respects, the one presenting alternate curves will better resist vertical pressure than one that is rectilinear, by reason of the decomposition of motive force that takes place at every curve.

Mr. Adams is very careful to show that there is no anatomical analogy, so far as the mechanism of motion is concerned, between the spine and the movable articulations of the extremities. This was the more necessary, for many writers have traced out analogies between the curvatures of the spine and the deformities that occur at these joints. The spinal muscles, Mr. Adams believes, are in the state of least activity in the erect position of the spinal column, and that their functions are not to produce by active contraction any flexion or curvature of the spine, but essentially to regulate and limit its movements, and to restore the equilibrium of the spinal column when disturbed. No ligaments exist, though spoken of by some writers, which, by contraction or relaxation, could cause curvature of the spine. At the sides of the vertebræ are only to be found some short and irregular ligamentous bands, interlacing and crossing over the intervertebral cartilages. It is by the articulating processes that the lateral and the antero-posterior motions of the spine are checked. Lateral curvature cannot take place without some alteration in form of these processes, and there is always accompanying it horizontal rotation of the bodies of the vertebræ. These points in the anatomy and physiology of the spinal column are of the very highest importance in the treatment of lateral curvature. If they are true, as we believe they are, the muscular and ligamentous theory of the produc-

tion of the deformity must be erroneous, and the modes of cure based upon it should be abandoned.

The third lecture is on anterior and posterior curvatures of the spine, and is a good practical essay on these deformities.

The fourth and fifth lectures are on the external characters and morbid anatomy of lateral curvature. They are the most important chapters in the volume, and indeed give to it its particular value. The same subjects are nowhere else treated so satisfactorily, and it is only by an accurate knowledge of them, that the principles of treatment applicable to the different classes of cases of curvature that present themselves to us in practice, can be determined.

According to the generally received opinion as to the mode of production of lateral curvature, this deformity is supposed to depend primarily and essentially upon muscular debility with a lax condition of the ligaments of the spine; structural changes in the bones and intervertebral cartilages are believed to take place only at a late period.

In cases of muscular debility lateral curvature is sometimes simulated, and a certain proportion will terminate in true lateral curvature, when this is not prevented by proper treatment. Mr. Adams, however, is positive that lateral curvature as frequently exists in individuals who do not exhibit any indications of muscular debility. Such cases are described by Mr. Adams as *weak spines, or cases of threatened lateral curvature.* They are chiefly interesting in reference to the treatment to be adopted rather than in their pathology. There can be little doubt that *cures of spinal curvature* have been largely derived from this class of weak spines, a curvature being assumed when no real curvature existed.

Mr. Adams maintains the opinion that any case of curvature of the spine, properly so called, however slight it may be, is always accompanied by structural changes; the bodies of the vertebræ are deviated laterally in a horizontal direction, and the oblique articulating processes are altered in their direction and aspects. Moreover, he demonstrates that there may be curvature affecting the bodies of the vertebræ, sometimes very severe, when posteriorly the apices of the spinous processes are very slightly, and sometimes not at all deviated from a straight line.

Rotation of the bodies of the vertebræ has already been described by writers on spinal curvature, but this condition is regarded as a late change, a complication, or a superadded condition. Mr. Adams teaches that rotation takes place at the beginning, and forms an essential part of a series of structural changes, and that the external lateral deviation occurs subsequently rather than previous to the rotation movement.

The means of detecting by external characters this rotation of the bodies of the vertebræ are very carefully described. These characters vary, of course, according to the form and situation of the curvature. When a single curve[1] exists in the lumbar region, a prominence of the crest of the ilium, caused by the sinking in of the abdominal walls, corresponding to the concavity of the curve, is the most conspicuous external indication. On the side of the convexity the spinal muscles are pushed outwards. A lateral deviation of the apices of the spinous processes seldom exists in a marked degree.

[1] It is, of course, anatomically impossible that any such condition as a SINGLE CURVE can exist. A second curvature forms simultaneously, for the purpose of maintaining the equilibrium of the body. It is not, however, externally apparent in all cases.

When a single curve exists in the dorsal region, it generally involves a considerable length of the spinal column. The symmetrical form of the body is more disturbed in this than in any other form of lateral curvature, in consequence of the length of the curve and its relation with the thoracic parietes. The level of the shoulders is conspicuously altered, even when the curvature is slight, and as it advances one shoulder becomes permanently elevated and the other depressed. The scapulæ are unequally distant from the spinous processes, that on the convexity being more distant than the other, and also raised above the level of the opposite bone. A posterior projection of the angles of the ribs, on the side corresponding to the prominent scapula, and a depression of the angles of the ribs on the opposite side, are always found, and as the curvature increases becomes one of the most conspicuous of the external characters. The ribs become more oblique in their direction, and depressed laterally as well as posteriorly in the concavity of the curve, so that the chest sinks in and becomes obviously depressed; on the convexity of the curve the ribs are more horizontal in their direction, and more widely separated from each other, than in their natural condition. The apices of the spinous processes present a more marked lateral deviation in this than in any other form of curvature, though, even in severe cases, they afford but a very imperfect indication of the extent of the internal curvature as it affects the bodies of the vertebræ. In slight cases, though the other external characters are sufficiently well marked, the lateral deviation of the spinous processes may be scarcely perceptible.

When the curve exists in the upper and middle portion of the dorsal region, it gives a high-shouldered and short-necked appearance, and produces a disposition to stoop. The scapula on the side of the convexity is tilted forwards, and the position of the trapezius muscle just above the scapula is often very prominent, so much so as to be occasionally mistaken for fatty or cystic tumour, or a chronic abscess. This same error in diagnosis has also occurred in cases where the lumbar muscles have been remarkably prominent. The sensation of fluctuation in these muscular swellings is exceedingly deceptive.

In double lateral curvature, when the curves are only of moderate extent, and about equal to each other in length, very little external deformity exists; much less than when the curvature is single. The curvature, as affecting the bodies of the vertebræ, may be very severe, when the lateral deviation of the apices of the spinous processes is very slight. In the dorsal region, however, the natural posterior projection of the spinous processes is diminished or lost, so that a flattening exists in place of a convexity, and in more severe cases the natural curvature is to some extent reversed. A posterior projection of the angles of the ribs, on the side of the convexity of the curve, and a posterior projection of the scapula, on the same side, are constantly present. The projecting scapula, moreover, is more distant than its fellow, from the spinous processes. On the side of the convexity of the curve there is a sinking-in, or depression, of the angles of the ribs. The form of the chest may not be perceptibly altered in these cases, when slight, but generally, the breast on the side of the concavity is more prominent than the other. In the lumbar region the spinal muscles are rendered prominent on the convexity of the curve, from the projection of the transverse processes of the lumbar vertebræ, caused by the horizontal rotation of the vertebræ that always takes place.

We have presented this *résumé* of the description of the principal external

characters of spinal curvature, given by Mr. Adams, because we have never seen elsewhere these means for detecting lateral curvature so well described. It is indeed generally supposed to exist only when the apices of the spinous processes are deviated from a straight line.

In considering the morbid anatomy of lateral curvature, Mr. Adams shows that the curvature depends upon alteration in the relative thickness of the intervertebral cartilages and the bodies of the vertebræ at parts corresponding to the curvatures, that the bodies of the vertebræ are turned round horizontally, and that these alterations are associated with changes of direction in the articular facets of the oblique articulating processes. It is this spiral twist of the spine that produces the posterior projection of the transverse processes, and of the angles of the ribs, just described among the external appearances, which are more certainly to be relied upon as indicating the existence of internal curvature than any curvature in the spinous processes. The structural changes in the cartilages, irregularly compressed, when examined microscopically, are found to be essentially of an atrophic and degenerative character. The texture of the bones, examined in the same manner, presents no unhealthy appearance. In certain places it is more close and compact; change of a reparative character, and calculated to arrest the progress of the curve. The oblique processes are altered in form and direction, and present a nodulated appearance around the margins of the articular facets; changes apparently similar to those by which the articular extremities of the long bones become enlarged in what is called "chronic rheumatic arthritis." The transverse processes are not only altered in direction, but they are also materially altered in form. They may become attenuated and project backwards; or, when resting on the crest of the ilium, they may become flattened from above downwards. These changes Mr. Adams believes to always occur; and, moreover, he does not believe that they are associated with or depended upon a rachitic condition of the patient. He draws a broad line of distinction between rachitic and other classes of lateral curvature; a line that cannot be too broadly drawn, for the rachitic is the only form associated with deformity of the pelvis, and therefore the only form in which danger in child-bearing need be apprehended, or any obstacle to marriage assigned upon medical testimony. No case is rachitic when there is no curvature of the leg bones, or other bones of the skeleton, no enlargement of the epiphyses, nor rachitic conformation of the skull.

The influence of lateral curvature upon the structure of the chest and of the pelvis, and in causing displacement of the thoracic and abdominal viscera, and compression of the spinal cord and nerves, is considered in detail, but we find nothing here to note particularly. In all the dissections he has made of severe cases of spinal curvature, Mr. Adams has found the muscles on both sides of the spine much wasted, pale in colour, and in more or less advanced stages of fatty degeneration. This condition of the muscles he believes to begin in those of the concavity of the curve, those on the convexity wasting at a much later period.

The six remaining chapters of this work treat of the mode of production of lateral curvature, its symptoms, diagnosis, prognosis, and treatment. The peculiar opinions held by Mr. Adams upon these several subjects being, of course, deduced from those held by him in regard to the anatomy and physiology of the vertebral column, and the morbid anatomy of lateral curvature, of which we have just given a full analysis, may be readily understood.

The muscular theory of the production of lateral curvature, which is the theory generally received by the profession, is rejected on anatomical and physiological grounds, and also a sbeing contradicted by facts that have come under his own observation and experience. For the same reasons he rejects the opposite theory of active muscular contraction, held by M. Guérin. That of Dr. Dods, who attributes lateral curvature to frequent and protracted voluntary muscular effort, is rejected for the same reason, and also as altogether insufficient to explain the phenomena of rotation, which Dr. Dods taught followed lateral curvature, instead of preceding it, as is really the case.

The practice of tight lacing, to which so much is attributed by many writers, above all, be it said, by those who write for the public eye, is not believed by Mr. Adams to have any injurious influence whatever in producing lateral curvature.

According to Mr. Adams, the immediate cause in every case of lateral curvature is essentially mechanical. Structural change is produced by mechanical pressure, the equilibrium of the spinal column being disturbed, and the weight of the head and upper extremities being thrown for a length of time in the same direction, from the long continuance of certain bad positions, by certain occupations, from inequality in the length of the legs, and from certain diseases, as empyema. The predisposing causes are essentially constitutional, either hereditary or acquired; such as hereditary predisposition, the strumous diathesis, and constitutional debility.

In the consideration of the general symptoms of lateral curvature, Mr. Adams naturally takes a different view from what we generally find maintained. The enfeebled condition of the general health, together with the associated functional disturbances of the internal organs of the chest and abdomen, such as palpitation of the heart, difficult respiration, derangements of the liver, stomach, and bowels, is generally regarded as the primary and essential affection to which the spinal affection is merely secondary. Mr. Adams declares, without hesitation, that these symptoms are to be regarded as essentially dependent upon the curvature of the spine, and that the proper treatment of the deformity will, in many instances, be sufficient alone to remove them all.

Among the symptoms of lateral curvature, spinal pain, or pain referred to the region of the spine, is particularly well described by Mr. Adams. We lay before our readers a good portion of his remarks on the subject, both on account of their particular value, and as affording an example of his style.

"Spinal pain, by which I mean pain referred to the region of the spine, occurs frequently as a symptom of lateral curvature both in slight and severe cases. When it exists in slight cases, I regard it as a fortunate circumstance, because attention is at once directed to the spinal affection, and the patient placed under treatment in time for a cure to be effected; but when pain is absent, and there are no other symptoms affecting the general health, as sometimes occurs in lateral curvature, those who have much experience in the treatment of these cases, know that in such patients the spinal distortion is frequently allowed to proceed to an incurable stage before any advice is sought. With such absence of pain and other symptoms, it may also happen that the external deformity is so slight as scarcely to attract attention when the girl is dressed, even though the spinal distortion exists in a marked degree.

"*Spinal pain*, then, is by no means a constant symptom of lateral curvature, nor do I recognize any general rule as to its presence or absence in any special class of cases, or any particular form of curvature; but when it does occur, it adds very much to the distress of the patient, by producing a sensation of sick-

ness and sometimes fainting, and often seriously affects the general health, which is sometimes still further impaired by the remedies adopted for relief. Hot brandy and water is frequently resorted to by some sufferers, whilst others habitually take opium; a second dose of opium taken for the relief of spinal pain at night, after the accustomed dose had failed to give the usual relief, was the cause of death in the case of Dr. Mantell, described in the previous lecture. These remedies are constantly resorted to by ladies without medical advice, but to a moderate extent we are obliged to sanction them when other means fail to give the necessary relief. A lengthened experience in private practice can alone make the surgeon familiar with the amount of real suffering, as wellas mental distress, entailed upon the patient in many cases of lateral curvature of the spine in its later stages; and yet in the early stages of this affection, when it is undoubtedly curable by simple means, it is generally regarded as an unimportant affection, one which the patient, by moderate care and attention to the general health, will grow out of; or at the worst, as one not likely to become of more importance than producing a little deformity, regarded as almost a natural condition when slight, and easily compensated by the dressmaker, when more severe.

"*Spinal pain* in cases of lateral curvature, may be either *diffused* or *local*, *i. e.*, it may either be diffused over the region of the spine in its entire length, or over the dorsal or lumbar region of the spine; or it may be localized to a particular spot in the neighbourhood of the spine or ribs.

"*When diffused*, the patient complains of a dull, aching pain in the back, with a sense of great weakness, worse in the erect or sitting position, and always aggravated by walking or other exercise, so that the patient abstains from all exertion; but the pain is not removed by lying down, though it is generally much diminished. In a few exceptional cases, I have known the pain to be worse in the night-time, frequently causing the patient to wake with an acute pain, for which various remedies were obliged to be resorted to. Externally, the skin over the spine is so morbidly sensitive, that the patient shrinks from the slightest pressure; even passing the finger lightly down the spine over the spinous processes gives pain. It is said by those who consider this pain to be entirely hysterical, that a firm and continuous pressure can be borne, but it has not been so in the cases in which I have tried it.

"*The cause of this diffused spinal pain* is certainly obscure. In many cases it is undoubtedly associated with hysterical symptoms, and then the hysterical explanation at once appears to be sufficient; but in at least an equal number of cases no other indications of hysteria exist, and we meet with it in patients at all ages up to fifty or sixty. It is commonly spoken of as spinal irritation, and we should certainly expect that irritation and pain at least would result from the twisted condition of the spinal column, with a corresponding alteration in the axis, or twisted condition of the spinal cord.

"In some few cases, though probably only in rare and exceptional instances, spinal pain is associated with a true inflammatory condition. A few years ago I assisted my late colleague, Mr. Lonsdale, to make the post-mortem examination of a young lady who had been some time under his care, and had suffered from diffused spinal pain which was considered to be essentially hysterical by the late Dr. Roots and other physicians, who had seen the case in consultation with Mr. Lonsdale. This opinion was held till within three or four weeks of the young lady's death, which was preceded by complete paralysis of the lower extremities, and other symptoms clearly indicating disease of the spinal cord. At the post-mortem examination we found inflammatory effusion with suppuration extending a considerable distance along the cord and membranes, with softening of the substance of the cord itself. Such cases, though rare, must lead us to be careful in our diagnosis as to the cause of pain when we meet with it in the more severe cases.

"When *local* spinal pain exists in cases of lateral curvature, it is referred to some spot in the neighbourhood of the spine, but not constantly either to the side of the convexity or the concavity of the curve; more frequently, however, the pain is referred to the side of the convexity, and when this is to the right—its most usual direction—in the dorsal region, the pain is generally referred to

a part a little below the angle of the scapula: and in the lumbar region, the convexity of the curve being generally to the left, a very acute pain is frequently referred to about the position of the transverse processes. These processes being altered in their transversity by the movement of rotation previously described, project towards the skin, and push outwards the lumbar mass of muscles along the convexity of the curve, so as to form an external prominence in this situation, which, as I have already mentioned, has been repeatedly mistaken for abscess, the muscular swelling giving a doubtful sense of fluctuation.

"In many cases under my care, the acute pain at this particular spot, always increased by motion, and by the erect or sitting position, and relieved, but not removed, by lying down, has been the most distressing symptom of the spinal curvature; and, for the relief of this pain alone, advice is frequently sought in many adult cases, when the patient has no hope of any improvement being effected in the distortion of the spine."

The cause of this pain, localized in particular spots, may be satisfactorily traced in all cases to some of the local changes described as taking place in the various structures of the spine during the formation and increase of the curvature. It is to be attributed to mechanical pressure and parts not adapted to receive pressure. For its relief Mr. Adams relies upon the application of a belladonna plaster, from three to twelve inches in length, along the spine, and the use of a strong and well-adjusted spinal instrument to give mechanical support to the spine.

When on the subject of the diagnosis of lateral curvature, the main points of which may be readily understood from what has already been stated in regard to the external appearances, and the morbid anatomy of the deformity, Mr. Adams cites a very remarkable case, to which he refers repeatedly throughout the volume. It is that of Dr. Gideon Mantell, first recorded in the thirty-seventh volume of the *Medico-Chirurgical Transactions*, (1854), under this title: "Case of Distortion of the Spine, with Observations on Rotation of the Vertebræ as a complication of Lateral curvature: by Thos. Hodgkins, M. D., and Wm. Adams." In this case, although the internal curvature was very severe, there was scarcely any lateral deviation of the apices of the spinous processes, and the true nature of the affection was altogether overlooked. We mentioned above among the external appearances in lateral curvature, a swelling in the lumbar region, from the pushing out of the muscles by the transverse processes of the vertebræ, and said it gave a deceptive feeling of fluctuation. In the case now in question, such a swelling deceived all the eminent medical and surgical authorities who had been consulted in the case, and among them were Coulson, Stanley, Lawrence, Bright, Liston and Brodie. So positive were some of them that the swelling was one of lumbar abscess, that Liston offered to open it, but this happily was delayed.

The future progress in any case of spinal curvature is extremely uncertain, still there are certain general principles that are of service in founding a prognosis. A curvature in the dorsal region can be controlled more effectually by mechanical means than one existing in the lumbar region, where the transverse processes cannot receive the pressure that can be applied to the ribs. The predominance of the local or mechanical causes, the general health being good, the absence of an hereditary tendency, and the curvature not beginning at an early age, are among the chief points influencing the surgeon in giving a favourable prognosis. He will be influenced moreover by the extent to which the curvature had become developed at the time when advice is sought, by the age of the patient, by the form of the curve, and by the evidence of rotation of the bodies of the vertebræ existing in a marked degree.

In considering the treatment of lateral curvature, Mr. Adams carefully applies those views of the general pathology of this affection which he has maintained, and which we believe he has succeeded in establishing in this volume. All the cases of this deformity are arranged in three classes, according to the relative degree in which they can be traced to depend upon constitutional and local causes, and the treatment best suited to the various cases included therein, is described in detail.

In the first class, or those essentially of constitutional origin, of course the constitutional treatment is of the first importance. These cases are, generally, young children who have been insufficiently nourished. Cod-liver oil, used not only internally, but externally, by being rubbed over the whole body night and morning after a bath, is the most valuable remedy for improving the general health and strength. The preparations of iron and the hypophosphite of lime are very useful. The child must not be allowed to sit or stand for any length of time, and the back should be supported by some mechanical contrivance, as by a piece of strong leather, if the child is very young, accurately moulded to the form of the back, and properly held in position. In children rather older, as from seven to twelve years of age, a light steel spinal instrument is recommended, with one or two lateral plates, according to the form and situation of the curvature. It is entirely unnecessary for this apparatus to be worn at night; the recumbent position effectually removes the cause that leads to the curvature.

For the purpose of keeping the patient in a reclining position, which should be done at least one-third of the day, the use of a reclining chair is recommended, the inclination being about 45°. In this position, the weight of the head and upper extremities is effectually removed from the spinal column, and the patient does not suffer from headache, indigestion, and those other inconveniences that so frequently attend lying down upon the inclined plane, or lying flat upon the floor, as has often been recommended. As affording an agreeable change from the reclining chair, what is styled a *prone-couch* may be recommended. In this the body is supported in front, and certain occupations, as drawing, music, and needle-work, are thereby facilitated. We have had one of these constructed for a female patient some fourteen years of age, and it gives great satisfaction. The use of the hand-swing, the elastic chest expander, and the drawing up a weight from the ground, are the means to be used for the gymnastic exercises best suited to these cases. When the curvature is situated chiefly in the lumbar region, the use of gymnastics in the horizontal position by means of an *exercising-plane*, is very highly recommended. They possess the great advantage of strengthening the body, and improving the general health, while, at the same time, the disadvantages of the erect position are completely removed.

The second class, or cases depending upon constitutional and local causes in about equal degrees, generally occur between the ages of twelve and sixteen years. We can generally trace, in these cases, some local cause acting mechanically, so as to disturb the equilibrium of the spinal column, such as standing on one leg, sitting cross-legged, or guarding some particular position for a length of time. Besides attention to position and to certain gymnastic exercises, these cases, when confirmed, that is, when attended by the anatomical deviations already described, require the use of spinal instruments, capable of giving firm support, and also of exerting a certain amount of active force or pressure. The instruments used by Mr. Adams in these cases are of two forms: one is a modification of the Eagland

spinal support; the other is a much stronger instrument of his own device. In his instrument mechanical force is exerted by lateral steel plates against the projecting ribs in the same plane, but in the opposite direction to that in which they have deviated from their normal position, in consequence of the rotation movement of the bodies of the vertebræ. The instrument should seldom be worn at night.

By this means cases of this kind, unless very considerable external deformity has occurred before they are submitted to treatment, are generally curable within one or two years.

Cases of the third class, that is, essentially depending upon local causes, acting mechanically, so as to disturb the equilibrium of the spinal column, require a treatment that is essentially local. Acquired bad habits must be discontinued; occupations tending to produce the curvature must be relinquished, &c. &c. Inequality in the length of the legs must be compensated for by raising the sole on the short leg. When these cases occur during the period of growth, the use of a spinal instrument may, in most cases, be recommended, either with the view of curing the curvature, when it arises from removable causes, or of preventing its increase when the curvature has advanced to an incurable degree, and when we cannot remove the cause by which it is produced.

These views of the morbid anatomy, pathology, and treatment of lateral curvature are more satisfactory to us than any we have elsewhere met with, and we desire strongly to call the attention of the profession in this country to them. The affection is here very frequently met with, while very few, indeed, of our medical practitioners understand ought of its true nature and of its proper treatment. What has been published upon the subject in this country will afford but little information. The "Report on Orthopedic Surgery," by Dr. David Prince, presented to the Illinois State Medical Society, at their meeting held in Bloomington, 1865, has some value, on account chiefly of historical information, and the description given of ingenious mechanical contrivances to be used in treatment. The paper on the pathology of the lateral curvature of the spine, by Dr. Charles Fayette Taylor, of New York, published in the fifteenth volume of the *Transactions of the American Medical Association* (1864), we feel it incumbent on us to refer to solely, in consequence of the respectability of the auspices under which it has been given to the public.

While we entertain the very highest opinion of the soundness and of the value of the views contained in this work of Mr. Adams, we are compelled to express regret at the manner in which he has laid them before the profession. There is a good deal of repetition, which fatigues the student, and at times, from a want chiefly of more methodical arrangement, it is difficult to seize the true sense and bearing of the expressions. The volume itself is very handsomely printed, and fully illustrated by plates and numerous admirably executed wood-cuts. W. F. A.

BIBLIOGRAPHICAL NOTICES.

ART. XVII.—*Transactions of the Medical Society of the State of Pennsylvania, at its Sixteenth Annual Session, held at Altoona*, June, 1865. 8vo. pp. 296. Philadelphia, 1865.

THE opening address to the session of 1865 by the President, Dr. J. D. Ross, of Blair—comprising a series of plain practical suggestions on the proper standard of education, scientific attainments, skill, moral worth, and personal deportment for the members of the medical profession—is marked throughout by good sense.

Reports were received from the societies of twenty-two counties. Several of these reports do not furnish any account of the prevailing diseases of the respective counties, nor a single contribution to etiology, pathology, or therapeutics. Others of the reports are imperfect and unsatisfactory, while none of them are, in respect to the fulness and value of the facts and observations they comprise, what they should be, considering the amount of talent which is embodied in the medical men of the State, and the wide and fruitful field for observation with which they are presented.

From a careful collation of such of the reports before us as profess to delineate the medical history of their respective counties, we find that throughout the greater portion of the State of Pennsylvania but little serious disease prevailed during the twelve months preceding June, 1865; or to speak, perhaps, more correctly, the diseases which then occurred were of a less severe type than usual, being more amenable to treatment, and consequently productive of a comparatively less amount of mortality.

All the reports before us concur in representing the periodic fevers, formerly so prevalent in most parts of Pennsylvania, as less regular in their occurrence, the cases being everywhere less numerous, while from some localities they have entirely disappeared.

"There is no part of Alleghany," says the report from that county, "which can be denominated *koino miasmatic*. For some years very few cases of intermittent fever have originated within the county. The only locality at the present time giving origin to this type of fever is in the northeastern extremity of Pittsburg, along the alluvium near the Alleghany River, where brick ponds exist. The cases, however, are mild and easily controlled."

In the report from Blair County it is stated that intermittent and remittent fevers are less prevalent than usual, but more prone to assume the typhoid form.

In the report from Bradford County, Dr. Mason states: "We have had a little more fever than for several years past. I have discovered nothing unusual about it, excepting its persistence; nearly every case lasted over twenty days, and some continued thirty days and upwards. It was the same fever which visits us nearly every year, during the summer months, and which I call *bilious remittent fever*. It does not, however, altogether resemble that disease, as described in the books. Many cases nearly resemble typhoid fever, and as such are considered by many physicians, but the absence of diarrhœa, and of the peculiar eruption of typhoid fever, with the fact of its frequent termination in intermittent fever, satisfy me that it is a miasmatic disease."

The writer of the present notice states, in the report from Philadelphia County, as follows: "During the latter part of the summer, and throughout the entire autumn (1864), I met with a number of cases of remittent fever, all more or less of an adynamic character. Notwithstanding they ran a very protracted course, still, under the ordinary treatment, they all terminated favourably."

"In the month of August (1864) I treated a few cases of a decidedly bilious type, and with remissions scarcely perceptible. The disease, at its height, was marked by intense heat of the skin, flushed face, yellowness and injection of the eyes, violent pain of the head and back, great distress at the epigastrium, with pain upon pressure; always nausea, often vomiting; costive bowels, a red tongue, pointed at the extremity, and coated, along its centre, with a thick, yellowish paste; a frequent, quick, and sometimes full pulse; delirium, especially towards evening and during the night. In one or more of the cases, seen by me, bleeding from the arm was resorted to with the best effect; in all, cups or leeches to the temples or nape of the neck, and leeches to the epigastrium were found decidedly beneficial. To unload the bowels of their tar-like contents calomel, or blue mass, with aloes, gamboge, or soap, or the compound extract of colocynth, was found to be among the best agents, and to be retained upon the stomach with far greater ease than any of the apparently milder cathartics. In one case, accompanied with great pain of the head, throbbing of the temples, acute delirium, and almost continued nausea, after many attempts to procure a discharge from the bowels, a number of leeches were applied to the forehead, temples, and behind the ears, almost immediately afterwards the bowels were, spontaneouly, freely evacuated, and it was not long before convalescence ensued. After the remissions were rendered distinct and free, healthy evacuations from the bowels were procured; in all the cases of fever just referred to convalescence was always rendered more rapid, and more quickly confirmed, by placing the patient at once upon the use of quinia.

"In the vicinity of Philadelphia *intermittent fever* is by no means so common a disease as it was in former years, while, in the heart of the city, it is never met with except in those who have contracted it elsewhere. It is no uncommon thing for a citizen who has visited a malarial district to return to his home apparently in better health than when he departed, but, after the lapse of a short time, to be attacked with fever and ague, which will be suspended by the use of quinia to recur subsequently, say in the following spring or autumn, with increased violence. In some instances paroxysms of chills and fever have, in such instances, recurred not merely once but repeatedly, after intervals of five and six months."

Since the foregoing was written many cases of intermittent fever have occurred within the very heart of the city of Philadelphia, and in persons, seemingly, who had not been exposed, either at home or abroad, to any malarial influence—certainly to none which could be detected.

While periodical fevers are fast disappearing from our State an increase of fever of a continued type, especially of the typhoid or enteric form, is noticed in all the reports before us. In that from Alleghany County, "typhoid fever," it is remarked, "has become epidemic in most parts of the county. It first made its appearance, and prevailed as a wide-spread and severe epidemic, about the year 1847, or, at least, it then became first recognized. Every year since it has occurred in some portion of the county during the latter part of summer, but especially during the fall months, and sometimes, also, during those of spring. In 1864 it made its appearance about the middle of August, and continued to prevail, with more or less violence, until the last of December. It was mild in character, and had a tendency to assume the remittent type. In the city of Pittsburg the ratio of mortality from typhoid fever of the whole number of deaths was one twenty-fifth.

In the county just named, it is stated that "An asthenic element, a vitiated tendency, and want of integrity in the circulating fluids of the body, have been noticed in nearly every class of disease. However inflammatory and high the grade of action at the invasion, this condition usually passed off, and was replaced by a typhoid disposition and increased prostration, requiring an early resort to a stimulant and tonic course of treatment."

In Blair County we are told that remittent fever was extremely prevalent. In about fifty per cent. of the cases, however, there was an evident blending of the remittent and typhoid types of fever. They ran a course of several weeks, followed by a long and tedious convalescence. Some of the cases were complicated with either epistaxis, hemorrhage from the bowels, or diarrhœa. These

discharges, at times, proved critical, convalescence following soon after their occurrence.

In Huntingdon County, during the winter and early spring, all diseases are reported to have assumed more or less of a typhoid form, and, almost from their onset, to have required a stimulant and tonic treatment.

The boom, situated on the west branch of the Susquehanna River, collects within it a vast quantity of organic matter, which is subjected to the intense heat of the sun during the summer months. The malaria thus produced has a marked influence upon the progress, duration, and termination of the diseases occurring in the immediate vicinity. Few families, we are told, escape an attack of intermittent or remittent fever. The latter being prone to assume the true typhoid character, with *tache rouge*, diarrhœa, etc. In all such cases the exhibition of quinia early in the day, in the first stage of the disease, was found to render the attack mild and lead to a speedy convalescence.

Spotted fever is not mentioned in several of the reports. The inference is that it did not prevail to any extent, excepting in a few sections of the State, during the twelve months preceding June, 1865.

In the report from Lehigh County we are told that a few cases of the disease were met with, mostly in persons under adult age, and all of a very malignant type. Retraction of the head set in early.

Dr. Evans, in the report from Montgomery County, relates two cases of spotted fever, all that he had met with. The family in which they occurred was, he states, particularly cleanly, and comfortable in all respects. Their dwelling was located in a valley through which runs a large stream of water. The disease, Dr. Evans adds, he has found to be always more prevalent along water courses; much the larger proportion of cases in his county having occurred about the shores of the Schuylkill and Delaware Rivers.

In Northampton County spotted fever appeared early in February, 1865. As in its preceding occurrences the disease extended for about two miles along both shores of the Lehigh River; never showing itself far from the river, excepting in a single case.

Dr. Green tried the effects of sulphite of soda in one case of the disease with favourable results. Pains were allayed, and the rigidity of the cervical muscles relaxed soon after the remedy was taken.

In the report from Philadelphia County the following remarks, in reference to spotted fever, are made by the author of the present notice:—

"Throughout the year I have met with cases of the so-called spotted fever. It was confined to no age, though more frequent, unquestionably, in young subjects than in those of middle age or beyond. The greater number of the cases were in males, yet the proportion of cases was not very decidedly in favour of one more than of the other sex. In regard to locations, my patients all resided in such as were of a comparatively healthy condition, and in dwellings by no means particularly objectionable in a sanitary point of view. Taking into view the entire history of the disease, as it has appeared in our midst, I think it will be found that it is most prevalent in low, damp situations, or in the immediate vicinity of sluggish streams, and in the autumn, winter, and spring months.

"The cases which came under my notice since June, 1864, were mainly of the tetanic form, there being present more or less decided opisthotonos, hyperæsthesia, with some degree of delirium, followed in many cases by coma, not generally, however, of a very intense kind. In three cases the disease assumed the algid form, and in ten it was attended with prominent symptoms of bronchial inflammation. These last thirteen cases all occurred during the interval between the months of November and March. The tetanic cases yielded very readily to treatment, quinine and opium internally, and blisters, dry cups, or vesicants along the course of the spine, but especially in the cervical region. Many of the cases required an early resort to alcoholic stimulants. The greatest care, however, is to be observed in the use of the latter. Given in the right cases, at the right period, and to the right extent, they invariably do good; but when mismanaged their influence is decidedly mischievous. It is only by experience, and watching carefully their effects when administered, that skill in their proper management can be acquired. In most, if not in all, cases I have seen the best results ensue

from the use of an infusion of half an ounce each of cimicifuga, serpentaria, and valerian, with one ounce each of the bark of the prunus Virginiana and sassafras, in a quart of boiling water, given in the dose of a wineglassful every three hours. Of the proper treatment of the algid form of spotted fever I can say but little. Of the only three cases I have met with, all of which occurred during the autumn and winter of 1864, I lost two. The remedies employed were the warm bath, sinapisms, and rubefacients externally, alcoholic and other diffusible stimulants, with quinia, internally. Under this treatment prompt reaction took place, and a very speedy recovery ensued in one case; in the others it appeared to produce no effect whatever. In the cases attended with bronchial disease a well-directed tonic and stimulant treatment was demanded in every case, with opiates, in well regulated doses, to allay irritation and cough, cups, either scarified or dry, to the posterior of the thorax, between the scapulæ, a blister to the chest anteriorly, followed by a soft emollient poultice, repeated three times a day, and continued thus for several days, were very generally of decided advantage. During convalescence the greatest care was requisite in order to prevent a relapse of the pulmonary disease from exposure to cold and damp, too thin clothing, etc."

The occurrence of scarlet fever is noticed in the reports from Blair, Huntingdon, Lycoming, and Philadelphia counties. Its prevalence appears, however, to have been very restricted. The disease, also, was of a comparatively mild type, and was attended by only a slight amount of mortality.

In nearly all of the counties from which reports were received, measles prevailed to a greater or less extent, and produced in many a large number of deaths, not from the disease itself, properly speaking, but from concomitant and consecutive bronchitis and pneumonia; diarrhœa was also a frequent accompaniment of the measles in some portions of the State.

From the contribution furnished by us to the report from the Philadelphia County Medical Society, we quote the following remarks:—

"In common with the scarlet fever and measles, and in the same localities in which these diseases most prevailed, numerous cases of *roseola* were observed. This exanthem, which has been studied with some care by several of the Continental physicians, especially those of Germany, is deserving of more attention than it has heretofore received on the part of the physicians of this country. Not that it is a disease of any great importance in itself, being unattended with any suffering, very generally disappearing spontaneously, when left without any indiscreet interference, and seldom, if ever, entailing any danger on the person in whom it appears. Its only interest results from the fact that it may be, and indeed often has been, confounded with either scarlet fever or measles; one or other of which exanthemata it so closely resembles, in different cases, or at different stages of the same case, as to render it difficult to distinguish it from them as a distinct and somewhat anomalous disease.

"While, as we have remarked, roseola in some cases simulates measles, and in others scarlatina, cases of it also not unfrequently occur in which it presents an eruption like measles on one day, and on the next, perhaps, one similar to that of scarlatina. Roseola seldom lasts beyond the second or third day; in some instances it disappears in from twelve to eighteen or twenty-four hours. It is very liable to sudden and even repeated relapses.

"It is said that, by the rash alone it is often impossible to distinguish one of the forms of roseola from a mild attack of measles, and another of them from the simplest form of scarlet fever. From the more severe forms of these diseases this can be much more readily done—if not by the difference in the eruption, by the concomitant symptoms, the sore throat, intensely hot and dry skin, and frequent pulse, and other decided constitutional disturbances in scarlatina; the coryza, injected and watery eye, fever, and other well-marked catarrhal symptoms, in measles.

"There is no reason for believing roseola to be contagious, though it will often make its appearance at nearly one and the same time, in several members of the same family, subjected alike to the same external conditions. It does, unquestionably, often prevail epidemically, and very generally precedes or accompanies epidemics of scarlatina and of measles. Its exciting cause may be, per-

haps, connected in numerous instances with certain local domestic conditions, errors of diet, or peculiar articles or forms of food or of clothing.

"The treatment required in cases of roseola is very simple; it should in every case be regulated by the character of the symptoms present."

Diphtheria, judging from the reports before us, has continued to prevail, more or less extensively, throughout the State. Exhibiting in some sections considerable malignancy, while in others, it was of a mild character, and readily controlled by an appropriate treatment. We find nothing in these reports calculated to throw any new light upon the esteology, pathology, or management of the disease. Nearly all who speak of their experience in its treatment depreciate the local application to the fauces of caustic or irritating substances. Strong testimony is borne to the good effects of ice applied to the throat, and held in the mouth, as recommended by Dr. H. Corson, of Montgomery County.

During the larger portion of the autumn and winter of 1864–65, and the spring of 1865, catarrhal affections, and inflammatory diseases, generally of the respiratory organs, appear to have prevailed throughout every portion of the State; in some portions of it to a much greater extent than usual. In most instances the cases were of an acute and sthenic character, and demanded the use of the lancet, cups, antimony, calomel, nitre, blisters, and the usual antiphlogistic treatment generally. In other localities, however, the cases exhibited a decidedly typhoid character, precluding the use of all direct depletion, and calling for an early resort to tonics and even stimulants.

The prevalence of the various forms of intestinal disease is noticed in nearly all the reports embraced in the present volume of *Transactions*. Diarrhœa, dysentery, cholera morbus, infantile cholera, etc., seem to have held a very prominent place among the diseases met with by the physicians with whose statements we are furnished, especially those in the interior of the State.

Erysipelas is noticed in several of the reports as having occurred in certain localities. In some sporadically—though to a much greater extent than usual—in others, epidemically, and of a very severe character. In the report from Philadelphia County, we present the following remarks in regard to the cases of erysipelas observed by us:—

"The disease I believe to be a true eruptive fever, the affection of the skin being as much dependent upon some morbid condition of the blood, or of the general system, as is the affection of the skin in scarlet fever, measles, or variola. In the cases seen by me, the erysipelas was of the true ambulant character, gradually spreading to the surrounding surface, usually in one direction, as it disappeared at the part it already occupied, and, in this manner, travelling over the entire face and scalp, as well as the greater portion of the upper half of the body. The colour was of a dusky red; large vesications early formed, filled with a very thin serum, sometimes of a yellowish colour, occasionally tinged with dark-coloured blood. The local swelling and sense of heat or burning were generally very considerable. The attendant fever was of a decidedly typhoid character. The fauces, in several of the cases, was dark red and dry, and the tongue very dark-coloured, dry, and shrivelled, rendering speech and deglutition difficult. In most of the cases, violent delirium set in early, and was followed often by low muttering delirium or coma. In none was the erysipelatous condition of the skin the result of any external injury. The disease was, in general, protracted in its course. The patients in whom it occurred were six of them females, and five males. Most of them were of feeble or broken-down constitutions. The oldest was sixty-five, and the youngest twenty-two years of age. There was nothing particularly objectionable, in a sanitary point of view, in respect to the location or condition of their dwellings. Of the eleven patients treated by me, nine recovered, and two, both males, died. The remedies I chiefly relied upon were the tincture of the muriate of iron, quinia, with, in nearly every case, diffusible stimulants and opiates. The only external application I made use of was lard, applied in sufficient quantity to keep the diseased surface from contact with the air. Blisters seemed to me to do more harm than good; painting with tincture of iodine failed to prevent, in every instance in which it was tried, the spread of the erysipelatous inflammation."

In many parts of the State smallpox prevailed extensively. It was not, how-

ever, so widely spread, generally speaking, or of so malignant a type, as was the case a few years since. Vaccination has been more universally and carefully performed of late years, and the importance of revaccination more fully recognized by the community at large. In several of the reports under notice, a series of facts, the most pointed and irresistible, are presented of the efficacy of vaccination, as a prophylactic of smallpox, provided it be repeated on the near approach of or actual outbreak in any given vicinity of the latter disease.

Following the reports from county societies, are three papers; two of them voluntary contributions from physicians of other States, and the other prepared in obedience to a special appointment by Dr. John Bell, of Philadelphia.

The first of these papers is the history of inoculation in Pennsylvania, by J. M. Toner, M. D., of Washington, D. C.

The paper is one of very great interest, not only because of its professed theme, and the faithfulness with which it is discussed, but on account, also, of the sketches, which are appended by way of notes, of the leading physicians of the early days of Philadelphia, from 1682 to 1791, and of the humble beginnings of the first American college—"now an honoured and formidable rival of the most celebrated of the medical universities of Europe."

The second paper is "On the Uses of Opium in Shock, Reaction, and Inflammations," by Edmund F. S. Arnold, M. D., of Yonkers, N. Y. The views laid down by the author are suggestive of important practical results, and in this light it is to be considered an important contribution to therapeutics. The following are the general conclusions at which the author has arrived:—

"1st. Opium is a highly compound drug, containing directly stimulating as well as sedative principles; the former are not less powerful nor less important to us than the latter in availing ourselves of its therapeutic action as a whole; to class it simply as a narcotic is to confuse our ideas of its true remedial actions, and frequently to cause it to be injuriously applied.

"2d. Owing to its stimulant tendencies, the prostrated and exsanguine conditions of the system are favourable, and, indeed, are necessary to full tolerance of the drug, which may then be beneficially exhibited in proportion to the extent to which they lower the vital powers.

"3d. When by the shock of a severe injury, especially if accompanied by excessive hemorrhage, the powers of life are reduced to the lowest ebb, the patient may frequently be rallied, when all other remedies are of no avail, by the stimulating and reviving powers of opium, administered at short intervals in moderately full doses of from two to three grains, or of laudanum in drachm doses or more.

"4th. In proportion as the vital powers are less reduced, the administration of opium during the shock becomes unnecessary, and will be fraught with more danger, and that it will be proper, therefore, to rely in part or wholly on other measures in ordinary use, such as warmth, friction, diffusible stimuli, &c., according to the circumstances of the case.

"5th. When reaction is indicated by returning sensation and pain, opium is an invaluable agent for controlling it, and preventing its excess, regard being had to the conditions under which a tolerance of it is established.

"6th. When, by general prostration induced by the severity of the injury, or by previous hemorrhage, or by venesection, tolerance of opium has been established, the allaying of pain may serve as a guide as to the extent to which it shall be given, and that it may then be safely carried to any extent necessary to accomplish that result, inasmuch as by its effect on the sensitive nervous system we are able to estimate and gauge its effects on the organic, and that further, the system should be kept under its influence until the reactionary dangers are past, readministering it as often as the recurrence of severe pain renders it necessary.

"7th. By its powers of rallying and supporting the nervous energy, allaying irritation, freeing and equalizing the circulation and keeping it within bounds, the system is placed in the best possible state for the healthy exertion of the reparative process or *vis medicatrix naturæ*.

"8th. As soon as this has been established in a healthy manner, the opiate may

be gradually withdrawn, and the case treated on general and established principles, according to the phases it may assume.

"9th. In proportion as reaction has advanced, and inflammation and constitutional irritation have set in, the free use of opium will be contraindicated, unless the inflammation be previously removed by bleeding."

The same views here set forth may be strictly applied, Dr. A. remarks, to the action of opium in ordinary inflammations.

The closing paper, by Dr. Bell, of Philadelphia, is "On Physical education." It is marked by learning and ability. The principles it inculcates are sound, and its teachings throughout practical and calculated to benefit health, promote vigour, and augment the feeling of comfort in those by whom they are carried out in all their details. We regret that the circulation of so able a paper on a subject of such general interest should be confined within the narrow limits beyond which it cannot be expected that the present volume of *Transactions* will extend. D. F. C.

ART. XVIII.—*Reports of American Hospitals for the Insane:*—

1. *Of the Indiana State Hospital, for the fiscal year* 1863–64.
2. *Of the Illinois State Hospital, for the fiscal years* 1862–63, *and* 1863–64.
3. *Of the Eastern (Kentucky) Asylum, for the fiscal year* 1863–64.
4. *Of the Longview Asylum, for the fiscal year* 1863–64.
5. *Of the Southern (Ohio) Asylum, for the fiscal year* 1863–64.
6. *Of the Central (Ohio) Asylum, for the fiscal year* 1863–64.
7. *Of the Friends' Asylum, for the fiscal year* 1864–65.

1. As, in former notices, we have given the State of Indiana all due credit—and that is much—for the munificent beneficence with which, when her *Hospital for the Insane* was founded, she assumed the burden of its total expenses, it is now necessary that, in justice to historical truth, we should record the fact that, more than once, she has, by legislative *inaction*, entirely overlooked the annual pecuniary claim of that institution, and permitted it to struggle on, as best it might, without an appropriation. Such was the fact for the fiscal year 1863–64, the report of which is before us; and relief from the embarrassments arising from the omission was only obtained through "the considerate care and irrepressible energy" of the Hon. O. P. Morton, Governor of the State.

	Men.	Women.	Total.
Patients in hospital, Oct. 31, 1863	147	148	295
Admitted in course of the year	93	101	194
Whole number	240	249	489
Discharged, including deaths	100	105	205
Remaining, Oct. 31, 1864	140	144	288
Of the discharged, there were cured	54	52	106
Died	10	5	15

Died with exhaustion of chronic mania, 4; exhaustion of acute mania, 4; consumption, 4; pneumonia, 2; apoplexy, 1.

A large part of this report is devoted to "Another Appeal for more Room." It appears that the building, as originally designed, has never been completed. One wing, intended for about one hundred patients, has not been erected; and it is for the construction of this that the appeal is made.

2. The reports of the Illinois *State Hospital for the Insane* are biennial; and the one now before us embraces the two official years, 1862–63, and 1863–64.

Patients in hospital, Dec. 1st, 1862	302
Admittted in course of two years	408
Whole number	710
Discharged, including deaths	409
Remaining, Dec. 1st, 1864	301
Of the discharged, there were cured	159
Died	42

Died of typhoid dysentery, 14; exhaustion from acute mania, 6; exhaustion from chronic mania, 3; epilepsy, 3; consumption, 2; smallpox, 2; suicide 2; softening of the brain, 2; paralysis, chronic diarrhœa, typhoid fever, pneumonia, abscess, carbuncle, hæmatemesis, and cancer, 1 each.

A large part of Dr. McFarland's report is occupied by a discussion of the subject of "the condition of the insane in their relation to institutions" in which a peculiar, but very annoying form of mental disorder is thus accurately described:—

"In these cases, the subtle unhinging of some radical constituent of the mental being, whose agency in the natural working of the machine is beyond our philosophy, produces a form of disease at once unique, perplexing, and in the highest degree difficult to treat with satisfaction. The small apparent evidence of a departure from mental soundness, especially at only a brief observation, adds to the embarrassments attending the case, as the individual is ever ready to play upon the doubts of any who may question the fact of insanity.

"There is usually just brain excitement enough to give increased force and acuteness to every operation of thought, and those unaccustomed to mental admeasurements may be struck only by what appears to them extraordinary brilliancy of idea and originality of expression. It is singular, but I believe true, that such persons may utter almost any continuation of spoken language without betraying themselves—the severer ordeal of writing, alone, serving to discover the diseased mental processes. What will add still more to the accumulated difficulties of the case, is, that the individual, quite frequently, understands precisely what will be considered proofs of insanity, and dextrously avoids actual commitment on subjects where the close student of the case can yet discover that there are diseased conceptions. The listener will sometimes be carried quite to the verge of some actually diseased point, and there be left, to reach it by the irresistible force of an inference.

"If all the difficulties attending such cases consisted in anomalies of thought only, few of them would become objects of hospital treatment, and thus would have no mention in this connection. But from this peculiar root of the matter, whatever it may be, there springs conjointly, a set of moral perversities which have the effect to throw the individual into cross purposes with others, of the most trying character. To thwart, disorganize, and destroy the salutary influences and purposes of others, who are moving along in the ordinary pathway of human affairs, is a mission upon which they are driven with all the impelling power of insanity—a force infinitely stronger than the incentives which proceed from reason and natural sense of duty.

"It is fortunate for others if some imaginary call breaks up the local attachments of such persons, and sends them abroad, as is frequently the case, as peripatetic reformers. A vagrant life has the effect to diffuse and dissipate, as it were, any intensities of feeling, and they eventually sink out of sight by the supervention of a mild but quite palpable insanity. Pent up within the limits of a family, a church, or a circumscribed community, the evil influence of such a person will eventually reach an explosive point, under which the prayers of their friends for their admission to the hospital become too pressing to be resisted. Those familiar with the history of the commotions of the infant colony of Massachusetts Bay, in connection with the doings of Anna Hutchinson, will find, in an investigation of the disease, the key to the singular career and hapless fate of that once famous personage.

"Happily these cases are few in the records of our institutions, as one instance will cause more annoyance than scores of ordinary cases. Of the propriety of their admission there will be many opinions—one class, only, being unanimous—those who have most to do with them and can best compare them with their former selves. In a hospital, their power of mischief is intensified by the limited area of their operations. To fill the minds of less intelligent patients—especially new comers—with prejudices and terrors, in the face of which no improvement is possible; to instil suspicions into the minds of friends of other patients by surreptitious correspondence; to set nurses at variance by artful misrepresentations; and to harangue visitors upon imaginary abuses suffered, are among the ordinary devices of these anomalous subjects. The

wondrous adroitness with which they will place themselves in positions where they can have some pretext for considering themselves as subjects of abuse; and their ceaseless clamor when their pet grievances have a colour of support, tax to the utmost the vigilance and patience of those assigned to the care of them. Most welcome is the day which brings the order for their discharge."

Of the cases of this kind which have come to our knowledge, there is one of which the foregoing description is so "like" that it would seem that the man must have specially sat for the picture. Being "pent within the limits of a church," his disease reached the "explosive point," at which he was placed in a hospital, where his career was conformable to the above account. Discharged moderated but not cured, he was imaginarily called "abroad, as a peripatetic reformer;" but we have good reason to know that those among whom he went did not consider the mission as particularly "fortunate" for themselves. In his case there was no supervention of a milder form of insanity, and no "sinking out of sight" until he sank into his grave.

3. The report of the Superintendent of the *Eastern Lunatic Asylum*, Kentucky, for the fiscal year terminating Sept. 30th, 1864, opens with a brief history of that institution, from the time of its origin; but as this subject has heretofore been sufficiently laid before our readers, it is unnecessary that we should give it farther attention.

	Men.	Women.	Total.
Patients in hospital Oct. 1, 1863 . . .	133	98	231
Admitted in course of the year . . .	26	19	45
Whole number	159	117	276
Discharged, including deaths	18	17	35
Remaining, Oct. 1st, 1864	141	100	241
Of the discharged there were cured . .	6	7	13
Died	10	8	18

Deaths, from phthisis pulmonalis, 2; exhaustion, 3; *paralysie générale*, 2; epilepsy, scrofula, paralysis, and dysentery, 1 each.

"Consumption continues to be the predominant, immediate cause of death. The phenomena presented by this malady, as it affects the insane, differ materially from those occurring in cases in the ordinary walks of life. There is far less suffering, little or no cough, and, in many cases, no notable expectoration until a few days before the final termination. Yet in some cases of this description we have found an almost total destruction of the pulmonary organs. Besides the physical signs, progressive emaciation is the chief symptom."

When writing in regard to the whole number of deaths during the forty years of the existence of the hospital, Dr. Chipley has made the following valuable contribution to hygienic knowledge:—

"It will be observed that death is attributed to diarrhœa in fifty cases. All of these occurred between 1844 and 1856. No note is made of the causes of death prior to 1844, and we cannot say how many may have perished of diarrhœa during the first twenty years. We know that, prior to 1856, diarrhœa prevailed in the institution at all seasons, and more or less of the inmates were its subjects at all times. I was convinced that this was owing to the water used in the institution, rendered impure by our drainage. Under the authority of the Board of Managers, after persistent solicitations to that end, an artesian well was bored to the depth of one hundred and six feet, and an abundant supply of water procured. At the time, there were about forty cases of diarrhœa in the hospital. After ten days not a case remained—no serious case has occurred since, and not a single death, from this cause, has happened since the source of water supply was changed in the spring of 1856. The annual average mortality during the past nine years was 6.00 per cent. The preceding nine years gave an average annual mortality of 13.21 per cent.; an excessive mortality, due in a great measure, I think, to the impurity of the water consumed in the institution during that period."

While acknowledging that the civil war "does not seem to have materially increased the number of the insane," the doctor, like several of his fellow-super-

intendents, expects an augmentation after the contest shall have ceased. "Habits of life," says he, "are everywhere changed. Thousands, who have lived in comfort, many, who were born and nurtured in affluence, are now engaged in a desperate struggle to supply the commonest wants of life; other thousands have been lifted from the vale to the heights of fortune, and are already running a course of dissipation and improvident extravagance, quite in contrast with the virtuous, quiet, humble life of the past. It is lamentably true, that morals have not escaped unscathed. We are becoming so inured to bloodshed, that the value of human life has fearfully depreciated. A thousand frivolous excuses are sought to cover the cruel acts of brigands, and the infamous practices of unscrupulous robbers. The whole moral atmosphere has become tainted. The last four years have indeed wrought wonderful changes, physically, mentally, and morally, and no such sudden and violent changes of habits, of modes of thought, and of processes of reasoning, can fail to yield, in the future, a profuse crop of bitter fruits."

This report contains much interesting matter which, by reason of our restricted space, we are obliged to disregard; and we close this notice of it with an extract from that portion which treats of the employment of patients.

"No serious accident has occurred with us, nor has any violence been done with the tools or implements placed in the hands of patients. During ten years I have hesitated in only one instance to place suitable tools in the hands of persons willing and capable of performing labour. The peculiar nature of this person's delusions, and the suddenness with which they seemed to exert their motive power, rendered it improper to indulge him in the use of the tools he had been accustomed to handle.

"A large number are employed every day, and these are reinforced on occasions by many more. We have had as many as sixty men in harvest field at one time; yet, joined in their labours by three or four careful attendants, they cheerfully worked together in great harmony. A heartier meal, eaten with a higher zest, and a sounder slumber at night, reward the labourers."

4. In the report of the *Longview Asylum*, Hamilton Co., Ohio, for the fiscal year 1863–64, Dr. Langdon thus writes of the liberal basis upon which that institution is founded:—

"It is a fact which may justly excite the pride of every citizen of Hamilton County, that there is no place, either in this country or Europe, which surpasses this county in its ample provision for all classes of insane; where all are received and cared for at the public expense, until they are restored to reason or released by death. * * * * All the insane, rich and poor, curable and incurable, are amply and comfortably provided for. * * * * Indeed, but few, and these the wealthiest of our citizens, can command the means of recreation, amusement, care and attendance provided in the Institution, at no cost to those who are residents of the county."

	Men.	Women.	Total.
Patients in Hospital, Oct. 31st, 1863 . .	179	177	356
Admitted in course of the year . . .	60	81	141
Whole number, ...	239	258	497
Discharged, including deaths	64	66	130
Remaining, Oct. 31st, 1864	175	192	367
Of the discharged, there were cured . .	35	45	80
Died	12	14	26

Died from phthisis pulmonalis, 10; epilepsy, 4; typhoid pneumonia, 3; general paralysis, 2; typhoid fever, puerperal fever, marasmus, inflammation of bowels, maniacal exhaustion, inflammation of bladder, and hepatitis, 1 each.

"One of the most disagreeable duties of the Superintendent," says the report, "consists in resisting the importunities of patients and their friends to allow frequent visiting. As a general rule, I allow no visits for the first two weeks after admission, and after that I am governed by the condition of the patient. When convinced that visits are positively injurious I peremptorily refuse admittance to every one, notwithstanding the fact that it generally gives great

offence to friends and relatives, who are apt to attribute my conduct to an unaccommodating spirit and a desire to display my authority."

Of the whole number of patients admitted since the outbreak of the rebellion, the insanity of thirty-two is attributed to "war excitement," and Dr. L. asserts his belief that most of these "had another origin." He fears, however, that after the return of peace there will be psychic revulsion more prolific of mental disorders.

5. The general statistics of the *Southern Ohio Lunatic Asylum*, for the year ending with the 31st of October, 1864, are as follows:—

	Men.	Women.	Total.
Patients at the beginning of the year . .	76	87	163
Admitted in course of the year . . .	38	45	83
Whole number	114	132	246
Discharged, including deaths	42	42	84
Remaining at the end of the year . . .	72	90	162
Of the discharged, there were cured . .	28	25	53
Died	8	6	14

Died with mania, 4; apoplexy, 3; consumption, 3; paralysis, 2; disease of heart, and gangrene of lung, 1 each.

In commenting upon the results of all the cases treated in the hospital from the time it was opened, Dr. Gundry says:—

"It will also be observed that the proportion of deaths of the males is much larger than that of deaths of females. So that, judging from the experience of this hospital for nearly ten years past, more males recover or die than females, and, therefore, that at the end of a given period, in the history of an equal number of both sexes of insane, there will remain a greater proportion of insane women than of insane men. And this will explain to some extent how it usually happens that in a census of the insane population of a country, the number of insane women exceeds that of insane men, and this, also, notwithstanding that a careful analysis of all cases occurring in the same region would show that more men than women actually become insane."

The report contains a brief narrative of one of those tragical events which occasionally mar the annals of the hospitals for the insane. We copy it nearly in full.

"On the 27th of July last, John Runk, an attendant, was killed under the following circumstances: He was assisting the patients at their supper, and was in the act of pouring out the tea, when a patient seized a carving knife lying on an adjoining table, and instantly stabbed him in the chest and abdomen, before assistance could be rendered by the other attendant and patients present. The first wound, which proved fatal, penetrated the chest, cutting through two ribs, and inflicting a deep wound in the substance of the liver. Death occurred after a few hours of suffering. * * * * The tragedy was the result of a purely homicidal impulse, without any special delusion associated with the unfortunate victim. The patient has been in the Institution more than nine years, and had made several sudden and violent attacks upon some of the officers and attendants. In none of these attacks was there any premonition or warning, and immediately after them he subsided into his usually quiet and docile demeanour. * * * * In this connection, I cannot omit to mention the promptness shown by some of the patients present, at great risk to themselves, in seizing the offender and taking the knife from his hand."

6. In the report of the *Central Ohio Lunatic Asylum*, for the fiscal year ending with the 31st of October, 1864, we are informed that Dr. R. Hills, who for more than eight years had filled the office of Superintendent, had resigned the place, having been appointed to the superintendence of the new hospital for the insane in West Virginia. His resignation was to take effect on the 8th of November, and his successor, Dr. W. L. Peck, was to begin his duties on the 1st of January, 1865, the place being filled, in the interim, by Dr. Wm. H. Morrell, First Assistant Physician.

	Men.	Women.	Total
Patients in hospital, Nov. 1st, 1863 . .	126	126	252
Admitted in course of the year . . .	74	89	163
Whole number	200	215	415
Discharged, including deaths . . .	76	74	150
Remaining Oct. 31st, 1864	124	141	265
Of the discharged there were cured . .	46	47	93
Died	9	3	12

In discussing the question of the effects of the war in the production of insanity, Dr. Hills, for the purpose of practical illustration, introduces a table showing the number of patients admitted into the hospital, from forty-two counties in Ohio, in the course of the preceding seven years—three and a half years of war, and three and a half years of the preceding peace. The number in the term of peace exceeds that of the term of war by 115, or 18.31 per cent.

He then proceeds: "The cases of insanity occurring have not been kept out of the asylum more than usual, in this State; but, on the contrary, if any difference, they have been more promptly brought than heretofore, the asylums being free and with open doors, while in many instances there is less ability to take care of the cases at home." He attributes the diminution to the wholesome influence of the diversion of the popular mind into new channels of thought, and the popular activity into new and important spheres of labour. "This diversity of employment and more constant exercise, give greater vigour and tone to the mind, and enable it better to bear the shocks of grief, and the wear and tear of anxious cares and responsibilities. The great law of mental and corporeal health is ACTION—energetic and diversified employment of mind and of body. Hence, strange as it may sound, this war by its various compulsions, is incidentally reducing insanity in the land, imparting wide-spread practical information, and giving to our younger population increased mental tone and vigour, that may tell even upon future generations."

7. "During the past year," writes Dr. Worthington, in his report of the *Friends' Asylum*, for the fiscal year 1864–65, "the average number of patients has been greater than in any previous year in the history of the institution. Owing, however, to the small number of recent cases under treatment, the number of patients restored has not been so large as in some previous years."

	Men.	Women.	Total.
Patients in hospital, March 1st, 1864 . .			63
Admitted in course of the year . . .			25
Whole number	36	52	88
Discharged, including deaths	6	16	22
Remaining March 1st, 1865	30	36	66
Of the discharged, there were cured . .	1	6	7
Died	2	6	8

Died with pulmonary consumption, 2; acute bronchitis, congestion of brain, epilepsy, enteritis, and injuries from a fall, 1 each.

This report corresponds very nearly with our idea of what an essay of the kind should be, inasmuch as it conveys to the reader a sufficiently definite understanding of the plan and the facilities for treatment, and to a certain extent portrays the benefit of that treatment. Reports of this kind afford less material than some others for the medical reviewer, but, at the same time, are best adapted to the wants of the people.

We do not remember to have seen the great aims in treatment more cleverly stated than in the following extract:—

"To assimilate, as nearly as practicable, the condition of the insane to that of persons in sound health of body and mind, and, in cases which cannot be restored, to employ their remaining faculties in the most rational way possible, are among the principal objects of asylum treatment. To imbue them with feelings of self-respect, in the exercise of which they may be stimulated to make use of their energies for their own and others' benefit, is one of the most important

points to be kept in view in the moral treatment of the insane. Nothing is better calculated to promote these ends than occupation in some useful employment which shall afford that amount of bodily exercise which is essential to the maintenance of the physical health, and at the same time give them the grateful consciousness that they are still capable of doing something useful."

"It would show a radical defect in the great system of hospital treatment of the insane, if it failed to make those who are its objects comfortable and contented with their lot; and no better proof could be furnished of its adaptation to the wants of the insane, than to see the inmates of such institutions satisfied with their condition, and preferring it even to remaining with their friends. That this is the case with a great majority of those who are thus provided for, I believe will be proved by the experience of all well conducted institutions of the kind. With the exception of a small number of patients, whose disease is manifested chiefly by an unhappy and discontented spirit which can be satisfied nowhere, the general feeling among the inmates of the asylum has been that of contentment and satisfaction. Those who have themselves experienced the benefits of hospital treatment can best appreciate them, and instances are by no means rare of patients who have been under the care of the asylum coming voluntarily to seek its assistance in a second attack."

It is believed that these voluntary returns are becoming frequent at most, if not all of our hospitals; and *voluntary first admissions* are not rare at some of them. P. E.

ART. XIX.—*The Practice of Medicine and Surgery applied to the Diseases and Accidents incident to Women.* By WM. H. BYFORD, A. M., M. D., author of a "Treatise on the Chronic Inflammation and Displacements of the Unimpregnated Uterus," and Professor of Obstetrics and Diseases of Women and Children in the Chicago Medical College. 8vo. pp. 556. Lindsay & Blakiston, Philadelphia, 1865.

WERE we to estimate the advance made in our knowledge of the pathology and therapeutics of the diseases and accidents peculiar to the human female, by the number of monographs and treatises devoted to their consideration, which have appeared within the few past years, we might reasonably infer, that the profession possessed a very intimate acquaintance with those diseases and accidents—their nature, seat, and causation, and with the means best adapted to allay the more painful and threatening of their symptoms, and to conduct most of them to a favourable termination.

That the maladies of women have been of late years studied to a greater extent and with more care than previously, and that, in consequence, our acquaintance with their pathology is more intimate and accurate, and our therapeutical management of them more rational and successful, is unquestionably true. It is, nevertheless, equally true, that many of the sexual diseases and accidents of women still remain involved in no little obscurity; that the more popular of the theories in regard to their pathology are unsatisfactory, while the means proposed for their amelioration or cure, are productive of comparatively little or no good. It is with pleasure, therefore, that we record the appearance of every new work on the diseases and accidents of women from an author of repute and experience, in the hope that from his observations and investigations some portion, at least, of our lack of knowledge in respect to those diseases and accidents may be supplied, and a greater unanimity arrived at as to their proper treatment.

The work of Dr. Byford is the latest that has appeared upon this subject. The author lays no pretension to entire originality, but presents the volume as "a concise, though sufficiently complete, practical, and reliable treatise," adapted to the wants of the student and junior members of the profession.

It comprises, certainly, a very fair *résumé* of the present condition of our knowledge on the subjects treated of in its several chapters. The author ad-

vances no particularly novel views, either pathological or therapeutical. He professes, however, to have tested the current opinions as to the nature and causation of the leading diseases and accidents peculiar to the female sex, and the means recommended for their amelioration or cure, by the results of his own extended observations and experience, and to have rejected all those which have not been sustained by such test. In this point of view, alone, the work is invested with no trifling interest, and will be received as a valuable addition to the standard works that form the basis of every physician's library.

In no department, perhaps, of medicine do we find so large a number of one-sided observations, and such an amount of false experience, as in that which embraces the especial diseases and accidents of the female sex. Some of the errors in pathology and practice which have in consequence resulted are pointed out by Dr. Byford; there are, we believe, many others which call as loudly for correction, and which have entirely escaped his scrutiny. The entire subject of displacements of the uterus requires, it is apparent, a more thorough and careful investigation than it has as yet received, in order to a more accurate determination of their true pathological signification, their frequency, the morbid phenomena to which they actually give rise, their causes, and the most appropriate means for their rectification; including, necessarily, a cautious and systematic examination into the value of pessaries, of the various forms and materials proposed by different practitioners, and the cases, if any, to which they are respectively adapted. The remarks of Dr. Byford on the use of the pessary are sufficiently cautious, and his enumeration of the circumstances under which its use is impracticable is sufficiently full; while his exposition of the evil effects caused by the abuse of the instrument would seem to be sufficiently pointed to deter all who shall carefully study it from an incautious and too frequent resort to them; nevertheless, he has not fairly met the main question, Do pessaries, the presence of which, confessedly, in many cases cannot be tolerated, and in others, from their improper use, are productive of serious mischief, effect in any case an amount of good, even when properly and skilfully employed, sufficient to counteract the dangers resulting from their abuse? We rather think that in his very limited commendation of pessaries, Dr. Byford has given in to the pressure of external authority on this question, rather than followed out the results of his own personal clinical experience.

The subject the most extensively discussed in the volume before us, is inflammation, acute and chronic, of the uterus and its appendages. Fourteen of the thirty chapters into which the treatise is divided are devoted to this subject alone. Inflammation, especially in its chronic form, constitutes the very basis of Dr. Byford's female pathology. Not only are the several groups of symptoms, which have been erected by the older writers, into independent diseases supposed to originate in uterine inflammation, but also nearly every ache and pain, every feeling of uneasiness to which woman is liable.

We have read the several chapters devoted to the history of inflammation of the womb and its annexes, its etiology, complications, progress, results, diagnosis, and treatment with deep interest. Though we believe that Dr. Byford has exaggerated the frequency of the occurrence of inflammation of the womb, and has laid it down as the cause of various morbid phenomena in cases in which it can exert no such agency, yet, with these exceptions, the subject has been unquestionably treated by him with much ability, and a careful study of this portion of his treatise will, we take pleasure to say, communicate much valuable practical information to "the student and junior practitioner."

Dr. Byford's account of puerperal fever is by no means very clear or satisfactory. He would seem to include under the term puerperal fever, every febrile affection of the recently delivered female, whether connected with inflammation of the womb, its sinuses, veins, etc., with utero or general peritonitis, or with toxæmia; the less or greater malignancy exhibited at different times by each of these forms of disease depending, as he believes, in great measure upon its occurring sporadically, or as the result of some endemic or epidemic cause.

With Dr. Byford we would willingly reject entirely the term puerperal fever

as one never strictly applicable to any of the diseases incident to the puerperal state, and from the loose manner in which it has been used, leading to the utmost confusion and the most serious errors in respect to the maladies liable to occur in child-bed. Confusion and errors which would be but little amended by adopting the term puerperal fever in only a generic sense, with a specific affix to define its meaning in the different cases to which it is applied.

We do not believe that all febrile affections occurring in puerperal females are identical, though we admit that they are all very greatly modified by the puerperal state, and, occasionally, by some prevailing epidemic or endemic influence. Our experience in conjunction with a pretty extended investigation of the subject has taught us that puerperal women are liable to a fever of the most formidable character, originating from a zymotic cause, traceable, in some instances, but not in others; a fever altogether independent, in every case, of inflammation, although such inflammation most generally occurs in the course of the disease as a secondary affection. This fever is a disease not peculiar to the puerperal female, but may occur also in the non-pregnant, the virgin, the male. It is propagatable by contagion or by infection, which latter will often adhere with great tenacity to the wards of a lying-in hospital, so as to propagate the disease to those who occupy them, even some time after they had been evacuated, and, apparently, thoroughly cleansed and aired.

That the disease just referred to, when it occurs in the recently delivered female, constitutes the most formidable of the febrile morbid conditions which have been included under the very loose term puerperal fever, can be established by an overwhelming mass of the most incontrovertible evidence.

Without formally recognizing the fact referred to, Dr. Byford, nevertheless, accedes to its correctness in his description of what he denominates the *toxæmic* form of puerperal fever. This description, although confused, and, in some respects, contradictory, has, in its general outlines, been very evidently drawn from the disease to which we refer as the most severe, unmanageable, and quickly fatal of the forms of fever, with which the puerperal female is liable to be attacked.

The chapters on uterine and ovarian tumors are marked by good sense and commendable caution. They embrace a tolerably clear and, though very concise, a fair exhibit of the present state of medical opinion in respect to the subjects treated of. The same may be said of the chapter on diseases of the mammæ. The one on phlegmasia dolens, or crural phlebitis, is clear and accurate and highly instructive.

We would beg leave to remark that in the case of a new edition of the work of Dr. Byford being called for, and we see no reason to doubt that such will be the case, the Latinity of the several prescriptions given in it will require a careful revision. It is now, certainly, anything but correct. It is to be hoped, also, that the bad taste of combining in the same prescription Latin and English, will be avoided.

We have remarked that the name of Dr. Robert Lee, author of the well-known and highly valuable work, *Researches on the more Important Diseases of Women*, is invariably misspelled by Dr. Byford, *Hay*. D. F. C.

ART. XX.—*Materia Medica for the Use of Students.* By JOHN B. BIDDLE, M. D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College, Member of the American Philosophical Society, Fellow of the College of Physicians, etc. etc. With illustrations. 8vo. pp. 359. Philadelphia: Lindsay & Blakiston. 1865.

THIS is a second edition, revised, enlarged, and adapted to the last edition of the United States Pharmacopœia. The author does not design his work "to take the place of the more voluminous and systematic treatises upon the subject," but he believes, nevertheless, "that it will be found to contain a succinct

account of all the articles of the Materia Medica in use in this country, and to furnish a suitable text-book to the courses of lectures delivered upon the branch."

The descriptions of the articles are summary in character and calculated to assist a student in answering questions propounded by a "quiz-master," or by a professor who may make use of the work as a syllabus of his teachings; but it is conjectured that from it alone a student could not acquire a sufficient knowledge to enable him to prescribe medicines satisfactorily, if it is necessary to discriminate in the application of articles which possess a common or analogous property or power, as, for example, jalep, scammony, gamboge, elaterium, and croton oil, all of which are termed hydragogue cathartics; but, whether all are equally adapted to all cases in which some hydragogue cathartic is recommended is not stated. Such objection, however, is not more applicable to this than to other *compendiums*. As a fair specimen of the succinct manner in which the author treats the subject, we copy, in full, his account of colocynth.

"COLOCYNTHIS—COLOCYNTH.—Colocynth is the FRUIT (deprived of its rind) of Citrellus Colocynthis or Bitter Cucumber (*Nat. Ord.* Cucurbitaceæ), an annual plant of the south of Europe and parts of Asia and Africa, resembling the common watermelon. The fruit is *peeled* and dried for exportation, and comes to us from the Levant. It consists of light, whitish, spongy balls, about the size of a small orange, filled with numerous seeds. For medical use, the *pulp* only is employed, and the seeds, which are inactive, are rejected. The pulp has a feeble odour, and a nauseous, intensely bitter taste. It yields its virtues to both water and alcohol, and contains a peculiar bitter principle, termed *colocynthin*, resin, &c.

"*Effects and uses.*—Colocynth is a violent hydragogue cathartic, acting sometimes very harshly even in small doses, and in overdoses producing dangerous and occasionally fatal enteric inflammation. The dose is gr. v to x. It is seldom, however, administered alone. In the form of *compound extract* (which contains also aloes, scammony, and cardamom), it is a favourite prescription—dose gr. v–xx; and the compound extract, combined with the extract of jalap, calomel and gamboge, constitutes a very popular compound, known as *compound cathartic pills*."

This description of colocynth would be improved for practical application and reference had the proportional quantities of the ingredients of the compounds named been stated. The reader of this compendium would refer to it in vain to ascertain how much calomel a compound cathartic pill contains, an item of information which it might be desirable to possess.

An elementary work on materia medica would be more useful if it embraced also some definite instructions on the modes of administering certain medicines. We are told (pp. 78–9), that ammoniac is a gum resin used chiefly "as an antispasmodic expectorant," and, "dose gr. x to xxx. A *mixture and plaster* are officinal." But the student might desire to know whether the dose of from gr. x to xxx of the gum-resin ammoniac is to be given to the patient in the form of pill, mixture or plaster, and at what intervals of time it should be repeated.

The book teaches that subnitrate of bismuth is prescribed in the "dose, gr. v to ℈i, or even ʒss, in powder or pill. Externally it is a good remedy in skin diseases in the form of ointment." How is the patient to dispose of a scruple or half drachm of subnitrate of bismuth in powder? Is it to be taken into the mouth dry, or mingled with water or syrup? How is a half drachm dose to be made into pill, and of how many pills should the dose consist?

Acidum nitricum dilutum; (p. 125) "dose, for internal use, 20 to 40 drops, three times a day, reduced with water."

How much water is enough to dilute forty drops of dilute nitric acid (specific gravity 1.068), to prevent it from irritating the surface with which it is placed contact?

Under the title arrowroot we find the following: "It is dissolved in boiling water (a tablespoonful to water Oj), and forms a gelatinous solution; a larger proportion of arrowroot makes a jelly-like mass." Prepared according to the method suggested in this direction, namely, to pour a pint of boiling water on a tablespoonful of arrowroot, or, to put a tablespoonful of arrowroot into a pint

of water at the boiling temperature, the article would not be in its most acceptable form.

We do not regard the small objections implied in the above citations as especially applicable to the work before us, because the same and analogous imperfections exist in most if not in all treatises on materia medica, not excepting even the classic works of Pereira, Royle, Wood and Bache, and others. Yet, in our humble judgment, the practice of medicine would gain something by having students taught, while they are learning materia medica, the methods and forms of administering medicines, especially such as require peculiar manipulation to render them fit to be offered to the lips of the patient. In cities where there are skilful druggists and expert nurses, it may be enough that the physician name the article and dose he deems proper for his patient. But in the country, in rural districts, in the army and navy, practitioners are required to be able to give detailed and minute directions not only about the administration of medicines, but also about the preparation of diet for the sick, and if they are ignorant of these details, upon the proper execution of which the comfort of the patient and success of treatment so often depend, there is no one at hand to supply the needful though simple information.

It is a fashion to overlook in medical descriptions, the unvarying standards of weight and measure which have been established and to take those which are uncertain, vague and changing. The fruit of colocynth is said to be "the size of a small orange," for example, yet the orange which would be called small in Brazil would be termed large in China: oranges may be from one and a half to four and a half and five inches in diameter and not be either small or large in comparison with those grown in the same locality. Similar remarks are applicable to the phrases "big as a hickory-nut," "big as the end of my thumb," "the size of a filbert," "big as an apple," and "high as Christ-church steeple," which was a classic unit of measure of height among the earlier citizens of Philadelphia.

Teachers of the science and art of medicine and surgery might abandon this fashion, advantageously for students, and apply the established standards of weight and measure instead. It seems preferable, even if nothing be actually gained, to direct that a dose shall be administered in a stated number of ounces or other uniform measure, than to employ the too common expressions, in "some" or "a little water," or "largely reduced," "slightly diluted," &c. But, it is believed that precise teaching in these apparently unimportant details is calculated to impress on the mind of the student the habit of being accurate in whatever relates to the art of prescribing and administering medicines.

The "Materia Medica for Students" is well written, clearly printed, and the twenty-four illustrations, though not very elegant specimens of the wood-engraver's art, fairly represent the general aspect of the plants they are designed to portray. It will be found a useful hand-book, by those students especially who may be under the instruction of its able and accomplished author.

W. S. W. R.

ART. XXI.—*On the Direct Influence of Medicinal and Morbific Agents upon the Muscular Tissue of the Bloodvessels.* By R. CRESSON STILES, M. D., etc. "Non fingendum, aut excogitandum, sed inveniendum." Read before the King's County Medical Society, Brooklyn, March 21, 1865. 8vo. pp. 26. New York, 1865.

WE have failed to discover whether Dr. Stiles, in attempting to show that the action of morbific agents—in the production of disease and that of remedial agents in its arrest—is exerted, through the medium of the blood, upon the muscular tissue of the bloodvessels, would restrict this to certain forms of disease, and to particular morbific and therapeutic agents, or extend it to all agents by which disease in every instance is induced, and, when induced, is either arrested in its course or conducted to a favourable issue. In the exposition of his views

Dr. Stiles has not observed that clearness and precision which are essential to a correct understanding of them in all their bearings.

It is very certain that Dr. Stiles believes the morbific matter, whatever this may be, to which the production of every form of fever is due, enters into, or is generated in the blood; and that the blood thus poisoned, by its action upon the bloodvessels, causes a general relaxation of their muscular tissue, and, in consequence, an augmented pressure in the arterioles and capillaries, with an increased rapidity of the circulation generally.

Fever is defined by Dr. Stiles to be "an acute morbid activity of the general circulation and vital combustion, caused by the direct action of a blood poison upon the muscular tissue of the bloodvessels." Increased activity of the circulation is generally, he remarks, regarded as the fundamental element of the febrile state, the remaining phenomena of fever being its natural results, or mere concomitants. He associates, he informs us, with the expression "*vital combustion*," no theory of animal heat, but would simply indicate the symptom from which fever derives its name.

Dr. Stiles has endeavoured to show—and it appears to us not without success—1. That no simply nervous theory is adequate to furnish an explanation of febrile phenomena; 2. That febrile phenomena cannot be explained alone by simply increased activity of the heart; and, 3. That the nervous disturbances exhibited in every case of fever are secondary or coincident, not fundamental and essential.

"The cause of the fever may lie, indirectly, in severe mental strain, or in some overpowering sorrow; the cause may persist in all its force when the fever is aroused, and, happily, often removes the system from nervous sway, and saves a life which would otherwise fail to sustain the nervous tension. A blood poison has been produced through the agency of the nervous system, which, by acting on the muscular tissue, has released the system from nervous control, and generated the fever. The admission of such an element is a necessity, for 'fever is more than the resilience of a bowed-down system,' and is warranted by the fact that the production of vitiated fluids through nervous agency is a matter of not unusual observation."

The essay of Dr. Stiles, though very far from being conclusive as to the validity of the leading views advanced in it, is nevertheless highly suggestive throughout, and may be studied with profit. Even though it lead not to the adoption of the views advanced in respect to the mode of action of morbific and curative agents, nor of the theory of the causation of fever set forth, yet there are some observations in the essay which are calculated to improve our knowledge of the etiology and therapeutics of the class of febrile diseases.

D. F. C.

ART. XXII.—*Obscure Diseases of the Brain and Mind.* By FORBES WINSLOW, M. D., D. C. L., Oxon, etc. etc. etc. Second American, from the Third and Revised English Edition. 8vo. pp. 348. Philadelphia: Henry C. Lea, 1866.

THE author of this work, by his numerous writings, among which we may enumerate the Lettsomian Lectures before the College of Physicians on *The Psychological Vocation of the Physician*, his essays *On the Medical Treatment of Insanity*, on *Medico-legal Evidence in Cases of Insanity; The Anatomy of Suicide; The Plea of Insanity in Criminal Cases*, his *Psychological Journal*, and the volume now under notice, has given an immense impulse to the study of insanity, and contributed largely to the elucidation of mental disorders, particularly those of an obscure character, and which had previously been too commonly overlooked. By unravelling the phenomena of mind in its natural state, he has led the way to a better knowledge of its diseased condition, and to the recognition of the premonitory symptoms—the *incubation*, as he calls it—of insanity.

The first edition of this work was reviewed at the time of its appearance (see number of this Journal for October, 1860), and we may state that the favourable opinion of it then expressed, has been confirmed by the sale of two large editions of it in England within three years, and one edition in this country. The third edition, of which the present American is a reprint, we find on examination to have been carefully revised throughout, and to be eminently worthy of the attention of the profession.

ART. XXIII.—*An Inquiry into the Possibility of Restoring the Life of Warm-blooded Animals in certain cases where the Respiration, the Circulation, and the Ordinary Manifestations of Organic Motion are exhausted or have ceased.* By BENJAMIN WARD RICHARDSON, M. A., M. D. 8vo. pp. 15. (From Proceedings of the Royal Society, June 15, 1865.)

IN this highly interesting memoir, the author, by a series of ingeniously devised and carefully performed experiments, has shown the reasons why the restoration of action in cases where life is suspended is at present so doubtful and difficult. The memoir is divided into two parts, the first containing the details of experiments, the second of an analysis of the experimental evidence with the conclusions to which the author has been led.

In the experimental inquiry, the animals operated on were subjected to such means for suspending their animation as produced the least possible change in the structure of organs, such as chloroform, carbonic acid, and drowning.

Throughout the inquiry, Dr. R. states, "I have kept steadily in view a process for restoring the development of force which is constantly and successfully being performed. A simple process enough! I mean the relighting of a taper. I see in the taper as it is burning the analogue of living action. The combustible substance having the force stored up in it circulating through the wick as through so many vessels, becoming distributed in the presence of incandescent heat so as to combine with oxygen; then itself liberating force, burning, and in the process showing spontaneous action, the analogue of living action.

"From this analogy I gather, further, that if I could set the blood burning as it burns in life, after its natural combustion has been suspended, I should relight the animal lamp, and that the redevelopment of force in the form of animal motion, which is life, would be re-established.

"But how in the case of the animal body is the light to be applied? That is the difficulty.

"Suppose that the taper or the fire were known only to us from their spontaneous manifestations, would the task to restore their burning if that had gone out be less difficult? What philosophical process should we adopt? We should first most naturally take fire from fire when that were possible. But how, when that were not possible, should we proceed to obtain the spark for kindling that which we might well know would burn spontaneously after kindling, the proper conditions being supplied? In such case we should most naturally look for the process by which fire is spontaneously exhibited, and we should discover it in the friction of one body with another; in the friction of stone, for example, with iron. Straightway we should imitate this and produce fire, and know how to renew and perpetuate it.

"Again, in our observation of burning bodies we should see often that a point of flame well-nigh extinguished would rekindle under a little additional friction of air, or an additional communication of matter that would burn, and we should acquire an art of sustaining fire by these measures.

"Lastly, as we went on observing we should discover that the force elicited in the combustion could be so applied as to set in motion almost endless mechanism; and we should learn, as we have learned, that however complicate the mechanism, however numerous its parts, it takes all its motion from the fire.

"The physiologist who would distinguish himself by learning the art of re-

suscitation must, I have thought, place himself precisely in the same condition as the primitive man who, in the matter of ordinary combustion, would pass to the civilized man through the phases I have described; and it seems to me that, so far as we have progressed, we have become acquainted with three natural steps in the inquiry at least. We have discovered that when the animal fire is declining from want of air, it may be fanned into existence again by gentle friction of air. We have learned by an experiment, first thoroughly demonstrated before the Royal Society in the early days of its remarkable history, that when the animal fire is waning, owing to deficiency of fuel, that is to say, of blood, it may be revivified by the direct introduction of new blood. Lastly, we have learned that the natural or spontaneous combustion of blood is due to the affinity of the oxygen of the air for combustible substance in the blood, when such substance is presented to the air over a sufficient extent of surface."

And further Dr. R. believes that the motion of the animal (the action of its mechanical parts) is produced by the force evolved in the process of combustion.

Dr. R.'s experiments "have reference to the best means to be adopted for fanning into active life the animal fire that is expiring but is not suspended. But they extend also to the deeper questions, whether animal combustion cannot be re-established when it appears to have been extinguished? and whether so-called vital acts would not be spontaneously manifested upon such re-establishment of animal combustion?

"In the part of this paper which contains the details of experimental research, the experiments are classified in three series.

"The first series of experiments has reference to attempts made to produce combustion of blood in the lungs by the introduction of air—*Artificial Respiration.*

"The second series embraces experiments in which attempts were made to induce circulation of the blood by physical operations—*Artificial Circulation.*

"The third series supplies the records of experiments in which the effects of *an increased temperature* upon the body were observed.

The following is a *résumé* of the results of Dr. R.'s experiments as to the value of artificial respiration:—

"Reviewing the whole series of experiments, I am led to the conclusion, and I think it admits of direct demonstration, that artificial respiration, in whatever way performed, is quite useless from the moment when the right side of the heart fails in propelling a current of blood over the pulmonic circuit, and when the auriculo-ventricular valve loses its tension on contraction of the ventricle.

"*Break of blood-column.*—At this point the blood-column is broken: the resistance to the passage of blood is of itself almost overwhelming, while the muscular action is decreasing in power in proportion as the difficulty of propulsion is increasing.

"*Obstacle from coalescence of blood-corpuscles.*—Another obstacle is in the blood itself. It consists in the rapid coalescence of the blood-corpuscles as the motion of the blood ceases. This is so determinate, that within three minutes after its complete cessation, the blood, though still fluid, often fails to be carried, even by a moderately strong stroke, over the lungs. In one experiment the chest of a strong dog was laid open while the animal was under chloroform, and artificial respiration was sustained. Both sides of the heart were acting vigorously, and there was a good arterial current. In the midst of this action, which could easily have been sustained for an hour, the pulmonary artery was suppressed for the space of two minutes and fifty seconds. Then it was liberated, and the ventricle, which was still beating vigorously and gave out a valvular sound, carried the pent-up column into the pulmonary vessel; but there was no circuit. The lung was somewhat congested, and the capillaries were blocked up so as to resist an impulse which, increased by galvanism, was more active for some minutes after the liberation of the artery than it had been previously.

"*Obstruction from coagulation of blood.*—The last obstruction is the coagulation of the blood; but as this does not, as a general rule, occur (in cases where the bloodvessels are not opened) within twenty minutes, and often not within an hour, it may be considered a secondary difficulty, though naturally fatal to success, according to our present knowledge, when it has taken place."

With regard to the modes of applying artificial respiration, and the time, the facts are as follows:—

"1. It is unnecessary and even injurious to employ it so long as there is any attempt at natural respiration.

"2. Before employing it, the patient should be placed with the head slightly lowered, a position which will largely assist the right ventricle in any feeble effort it may be making to propel a current of blood into the pulmonic circuit.

"3. It is of the greatest importance that the air conveyed into the lungs should be at a temperature above 60°; air below that temperature should never be used.

"4. All violent attempts to introduce large quantities of air are injurious; for whenever the pressure of the blood from the right side of the heart is reduced, the danger of rupturing the air-vesicles by pressure of air is increased. In a word, the practitioner should remember that he is doing the same act, virtually, in artificial respiration, as he is when attempting to relight an expiring taper. Any violence will only disarrange the mechanism, and turn the last chance of success into certain failure.

"5. So long as care be taken to sustain a gentle action of respiration, it signifies little, in my opinion, what means be employed. I have found a double-acting bellows, described in the experimental part of this paper, answer every purpose fairly. If any philosophical-instrument maker could invent a good and portable electro-magnetic machine with my metronome principle applied to it, so that from fifteen to twenty shocks per minute could be passed from the larynx to the diaphragm directly, the most perfect attainable artificial respiration would be secured so long as any muscular irritability remained; and I should suggest the value of such an instrument in cases where it could be brought into operation immediately after natural respiration has ceased. In combination with air heated from 120° to 140° for inhalation, every possible advantage that could accrue from artificial respiration, or rather from respiration artificially excited, would be secured, the persistence of muscular irritability being at the same time a sure index that the effort should not cease."

The observations Dr. R. has made in regard to heated air, leads him to suggest that in all receiving-houses for the drowned "a room should be set apart the air of which should be at 140° in summer, and 130° in winter. If bodies taken out of the water showed any indications of breathing, it would be sufficient, in my opinion, to place them in such an atmosphere, simply providing by the position of the body for the escape of water from the lungs. There would be under such conditions quick evaporation of water adhering to the bronchial surface, while the warm air would quicken the respiration, encourage the action of the heart, and prevent radiation of heat from the body. If artificial respiration were considered necessary, its performance in such an atmosphere would render the possibility of recovery far greater than if a low temperature and a moist state of atmosphere prevailed."

The second series of experiments were made with a view of ascertaining the effect of various physical means in restoring the circulation. Various processes were adopted. "In one class of inquiry oxygen was gently infused into the circulation, either in the form of gas, or in solution as peroxide of hydrogen, in order to see if by this means the heart could be stimulated into active contraction. In other instances water heated to a given temperature was injected, or the vapour of water. Again, electricity was brought into play; and, lastly, various mechanical contrivances were introduced, either for forcing the blood over the system or for drawing it over."

From his experiments with oxygen introduced into the circulation directly, Dr. R. infers that this agent "possesses the power of calling forth muscular contraction. This power seems to be due to the combination of the oxygen with a little blood remaining in the circulatory channels, and to the evolution of force from that combination. The effect of the oxygen, therefore, is extremely limited; and when introduced in the gaseous form, the distension it produces leads to a certain degree of disorganization of structure. I do not at this moment see, therefore. that oxygen admits of being applied as a direct excitant of the heart; but it is worthy of remembrance that the element produces tempo-

rary excitability when diffused through muscular structure recently rendered inactive."

Many attempts were made to restore the circulation by means of heat conveyed into the vessels by heated fluids. Dr. R. "first observed that when vapour of water (steam) at a temperature of 130° was driven into the arteries, there was at once rapid and general muscular action, the heart participating in the movement, but less actively than the voluntary muscles."

Dr. R. also used simple water for injection "heated to various degrees, from 96° to 130°. When water is thus injected, the animal being only a few minutes dead, and the water not being below 115° Fahr., the extent and activity of the muscular contractions are even more marked than when galvanism is brought into action, but in the greater number of cases the effect of the warm water ceases in from fifteen to twenty minutes." Dr. R. attributes the action produced on the muscles to the heat evolved by the water.

Blood held fluid by alkali, oxidized and heated to 96° was employed, but it excited no response on the part of the heart.

"Electricity, in the form of electro-galvanism, was employed in several experiments and in various ways to excite the heart. The little battery of Legendre and Morin, with the addition of the metronome so as to regulate the stroke, was the instrument used, and artificial respiration was combined with the electric process."

The inference which Dr. R. draws from his experiments with electricity on the heart is, "that by rapidly establishing a direct circuit between the blood in the right side of the heart and the external surface of the organ, using a moist conductor from the positive pole for the external surface, a sufficient contraction may (I had almost said, by a fortunate accident) be induced in the right ventricle to drive over the pulmonic current of blood, and to allow of its oxygenation by artificial inflation of the lungs. This fact at first sight looks small; but I value it beyond measure, because it has demonstrated that, when the action of the heart has ceased, the chest of the animal being open and all the conditions for reanimation being most unfavourable, the mere passage of blood from the right to the left side of the heart is sufficient to re-establish the action of the left side; that the left side thus reacting can throw a blood-current into the arteries; and that upon the reception of blood by the system, general muscular action and rhythmical action of the muscles of the chest are reproduced." This agent it must be observed is, however, not devoid of danger.

"My experiments," Dr. R. remarks, "clearly showed that the natural muscular irritability, while it is for a short time made more active by galvanism, is shortened in duration. This is natural. The irritability of muscle is in proportion to the degree of force which remains in it after the blood is withdrawn which force is evolved in proportion as it is called forth. It is well, therefore, in applying galvanism for any purpose to the subject in whom the action of life is suspended, to use the agent for one definite object, and to remember that, in proportion as it is used, its power for good diminishes."

In the last division of the physical series of experiments "the object held in view was to set the blood mechanically in motion through its own vessels. The attempts were made (*a*) by forcing blood towards the right side of the heart and into the lungs by the action of a syringe fixed in a vein, (*b*) by trying to draw over a current of blood into the arteries from the veins and over the lungs, (*c*) by trying to inject the heart of one animal with blood derived from another animal."

Dr. R. inquires whether a fluid resembling arterial blood, and capable either of being readily compounded when required, or of being kept ready for use, and capable also, when heated to 98° of restoring the muscular power of the heart, may not be invented. If it can, then the operation of injecting the heart by a carotid or brachial artery will, he says, be the most important practical step yet made towards the process of resuscitation when the motion of the heart has been arrested.

If such a fluid could be discovered, Dr. R. states that "it would be necessary in using it, to feed the heart, not in one continuous stream, but stroke by stroke, as in life; for it seems to me that the stroke supplements or, more correctly

speaking, represents a certain measure and regulation of the force derived from the combustion of the blood."

In a note appended to this paper, Dr. R. makes the following important statement: "Since this paper was laid before the Society, I have determined by a direct experiment that rhythmic stroke is of the first importance in restoring muscular contraction. By means of a machine which can either be worked by the hand or by electro-magnetism, I was enabled, assisted by my friends Drs. Wood and Sedgewick, to introduce blood heated to 90° Fahr. into the coronary arteries of a dog by rhythmic stroke, and at the same rate as the stroke of the heart of the animal previously to its death. The result was, that one hour and five minutes after the complete death of the animal, its heart, perfectly still, cold, and partly rigid, relaxed, and exhibited for twenty minutes active muscular motion, auricular and ventricular. The action, which continued for a short time after the rhythmic injection was withheld, was renewed several times by simply re-establishing the injection."

The third series of experiments were conducted to ascertain the effects of external heat applied to the body that has ceased to show evidence of life. "In no case was there any restoration of vitality; but it was observed that those parts of the body that had been more directly exposed to the heat showed the earliest indications of cadaveric rigidity. In the experiments where death took place from chloroform, and where the animals had been exposed to a temperature of 100°, the heart at the end of an hour was found still excitable, and on the right side was contracting well without the application of stimulus. This did not occur in the cases of death from drowning and carbonic acid, nor yet in cases where the warmth was carried above the natural temperature. These observations are of moment as indicating two facts—viz., that chloroform is less fatal as a destroyer of muscular irritability than either carbonic acid or the process of drowning; and that in the application of temperature to the external surface of the body by the bath, it is not advisable to raise the temperature many degrees above the natural standard."

The following are the author's general conclusions and indications:—

"I have already shown that artificial respiration is of service only when blood from the heart is being still distributed over the capillary surface of the lungs—or, to return to the simile with which I set out, that the process is simply one of fanning an expiring flame, which once expired will not, in spite of any amount of fanning, relight. The further conclusion to which I am at this moment led, goes, however, beyond the process of artificial respiration; returning again to the simile, I venture to report that, even when the heart has ceased to supply blood to the pulmonic capillaries, during the period previous to coagulation, the blood may be driven or drawn over the pulmonic circuit, may be oxidized in its course, may reach the left side of the heart, may be distributed over the arteries, and that, thus distributed, it possesses the power of restoring general muscular irritability and the external manifestations of life. Hence I infer that resuscitation, under the limitations named, is a possible process, and that it demands only the elements of time, experiment, and patience for its development into a demonstrable fact of modern science."

Dr. R. is still engaged in this experimental inquiry, and we shall look for his future results with great interest.

ART. XXIV.—*The Practice of Medicine.* By THOMAS HAWKES TANNER, M. D. F. L. S., M. R. C. P., Vice-President of the Obstetrical Society of London, etc. etc. etc. From the fifth London Edition; enlarged and improved. 8vo. pp. 835. Philadelphia: Lindsay and Blakiston, 1866.

IN its passage from the first to the fifth edition, the work of Dr. Tanner has gradually increased in size from a thin duodecimo volume to its present proportions of a goodly octavo of over eight hundred pages. With its growth in

size, its comprehensiveness as well as the general value of its contents has augmented in an equal ratio. It may now be received as a tolerably full and accurate compendium of the practice of medicine, and a useful text-book for the use of the student whilst in attendance upon a course of medical lectures.

The leading requisites of a work like the present are, conciseness, so far as this may be consistent with perfect clearness, and accuracy in all its teachings, so that they shall be a true reflection of the facts and observations which have received the sanction of the most reliable medical authorities. So far as conciseness and general accuracy of teaching are concerned, we have but little to object to the volume before us, viewed in the light simply of a compend of the practice of medicine. The leading objection we have to the work is the very unequal execution of its several parts, many of the forms of disease of common occurrence, and of paramount importance from their extreme severity, and the disputes which exist among physicians as to their causation, their seat, their nature, and their treatment, have but a few brief sentences devoted to their consideration, while to the discussion of others of far more rare occurrence, less severe in their character or which are better understood in respect to their pathology and management, far more space is allowed.

From the fact that the treatise of Dr. Tanner has reached, within a comparatively few years, its fifth edition, it is sufficiently evident that works of the class to which it belongs are in demand. Now if this demand is not properly supplied, it will most certainly be by miserable compilations more apt by far to mislead than to instruct; hence the importance of stamping with approval such works of the class as present nothing especially exceptional in matter—no glaring errors in the principles they advocate or in the practical precepts they inculcate. Of such a kind we believe to be the work before us, and as such we recommend it to the notice of students and graduates who are in search of a tolerably full and faithful manual of the practice of medicine. D. F. C.

ART. XXV.—*The Principles of Surgery.* By JAMES SYME, F. R. S. E., Professor of Clinical Surgery in the University of Edinburgh, &c. &c. &c. To which are appended his treatises on "*The Diseases of the Rectum*," "*Stricture of the Urethra and Fistula in Perineo*," "*The Excision of Diseased Joints*," *and numerous Additional Contributions to the Pathology and Practice of Surgery.* Edited by his former pupil, DONALD MACLEAN, M. D., L. R. C. S. E., Prof. of the Institutes of Med. and Lecturer on Clinical Surgery, Queen's University, Canada. 8vo. pp. 880. Philadelphia: J. B. Lippincott & Co., 1866.

THIS neat and convenient collection of the principal surgical writings of the well-known veteran Edinburgh operator and teacher of clinical surgery, will be gladly received by a large number of readers on this side of the Atlantic. It is published under express authority given by Professor Syme in answer to an application for the purpose by the American editor, made "in compliance with a request which had frequently and urgently been pressed upon" the latter by his "professional brethren in different parts of the United States and Canada."

Professor Maclean appears to have succeeded well in the object proposed, of associating in one volume with his "Principles," the "most valuable of the author's numerous special contributions to the pathology and practice of surgery;" and in this will probably gratify Mr. Syme's own very natural desire to have his writings known here "in a pure form" as much as he will please and benefit the professional students of this country in bringing the best works of a celebrated teacher within their reach. It is unnecessary to say that these works, as well as their author, have been widely known and esteemed in America. Just thirty-three years have passed since a faithful copy—now before us—of Mr. Syme's first edition of the "Principles" was published in Philadelphia. He had already become a man of mark in his particular vocation as a clinical

lecturer and as a leader of great promise in operative surgery. We need scarcely say that nothing has since occurred which shows a tendency on his part either to loiter in his onward course, as he understands it, or to hide his light under a bushel, whether that light shine like other men's or not.

The fifth edition of "The Principles" is a very great improvement on the first one, although identical throughout the first fourteen of the present twenty-five chapters. The same clearness and force of language and compactness of discussion; the same practical sagacity, operative skill, breadth of view and independence of judgment, are still more prominent; but, in many places, unfortunately, we encounter the same meagreness and unsatisfactory brevity, due to a dread of "overteaching." These defects will strike even the advanced student of the present day; while the practitioner and the hospital surgeon or the clinical teacher, whether old or young, will be frequently disappointed with the summary dicta of the last edition as they would have been with the numerous omissions of the first, although they cannot fail to find a great deal deal more to admire in the recent edition.

In fact, the advance of Mr. Syme's idea of what such a book ought to be has been so material in the progress of the past thirty years that his latest modification must be regarded as not only an able, but, for most purposes, a sufficiently complete outline of the Principles of Surgery—a text-book, in which, with few exceptions, the leading questions in theory and practice are freely and fairly discussed in the light of the latest general experience. Although the conclusions of the distinguished author are always unmistakably expressed, in accordance with his personal views and experience, they are generally presented with a candor and caution and courtesy which are not characteristic of many of his more ephemeral and doubtless less considered performances. As an instructive body of Surgery from one of the first surgical authorities of the day, it is certainly a valuable addition to our American libraries.

The volume on the Principles, although undoubtedly ample in connection with his interesting clinical instruction and as "a text-book" to his "systematic course," is chiefly important to us because, in his own words, it "contains the principles which I have endeavoured to illustrate in my clinical lectures during the last thirty-four years." His "aim has not been to collect all that might be said in regard to each subject, but rather to select what seemed of most importance, and arrange it in a convenient order for teaching or study, so as to constitute a framework of surgical science, which might be filled up through the gradual acquisition of professional knowledge." Much as we respect his aim and the manner in which he has sought to accomplish it, we should be sorry to recommend his work in place of several which we might name as the "framework" here proposed. There is, doubtless, a golden mean to be attained between overteaching and underteaching; but for truly practical purposes we prefer to go with the crowd of the day, after the bulky volumes, in the search for the *lex scripta* of our science and art; and would rather take the burden of too much teaching, than run the risk of too little.

In this aspect, the addition of the appendix adds greatly to the usefulness of the more systematic work, as it supplies a considerable amount of the clinical illustration and amplification which is avowedly required to complete a full course of instruction. It is unnecessary to notice these additional chapters as they consist of well-known publications, some of them of many years' standing, and all of them essays or reports which have been discussed from time to time in this journal as important contributions to surgery. Our readers will be glad to have them thus brought together in an attractive and available form, because, notwithstanding a few shortcomings and unusual views that may surprise them, here and there, they will find much that is practically useful, in addition to the numerous topics, including modes of treatment and important operations, with which the name of Syme is inseparably connected.

The American editor will have numerous sympathizers with himself and his fellow-pupils in their faith in their unquestionably eminent "old master and friend;" but, with all our admiration for the many sterling qualities of that master, we cannot agree to the wisdom or justness of Dr. John Brown's eulogium quoted in the preface. It is rather too extravagant an introduction to

such a collection of papers as these of Mr. Syme's, even supposing this "expression of their sentiments" to possess the accuracy and eloquence which Dr. Maclean so gratefully accords to it. Such fancy-work may do very well for the entertaining pages of the author of "Spare Hours" and of "Rab and his Friends," but is not likely to make much impression of the kind desired upon the readers of the "Principles of Surgery" and of the appended contributions; nor can we believe it will be much more acceptable to their learned and skilful author.

Mr. Syme has spoken his mind and written too much during the last thirty years, not to be generally known as decidedly not the paragon of innocent and unerring devotion to truth and charity which his Edinburgh laureate and quondam disciple has painted him. A man of honest intentions and notoriously strong convictions, with an earnest desire to urge those convictions on his neighbours, and ever exercising an uncompromising boldness and rare ability in illustrating his opinions, Mr. Syme has not always been able to overcome the spirit of prejudice or to conceal its effect upon his views and actions. It would be easy to show that, like many other people of self-confident character, he is not only a good deal of a Cerberus in watching others, but something of a Briareus in dealing with them. He belongs to the class of fulminating prophets in the Esculapian priesthood; and sometimes it has happened in the excitement of his fulminations that it would be hard to tell whether he was trying "to be on the side of truth" or "to have truth on his side." Nor are we disposed to say whether he shines most on these controversial occasions in offensive or defensive warfare.

A man of Professor Syme's acknowledged powers and claims to honourable distinction, both for what he has done and what he has taught to hundreds of patients and pupils throughout a whole generation, is not to be judged by occasional peculiar opinions or moments of weakness; nor is he to be upheld or exalted by a style of laudation which is generally monopolized by the advertising columns of the newspapers. E. H.

ART. XXVI.—*The Essentials of Materia Medica and Therapeutics.* By ALFRED BARING GARROD, M. D., F. R. S. Fellow of the Royal College of Physicians; Professor of Materia Medica and Therapeutics at King's College, London; Physician to the King's College Hospital; and Examiner in Materia Medica in the University of London. 8vo. pp. 439. New York: William Wood & Co., 1865.

THAT teaching the properties, the modes of compounding and combining, and the applications of the very numerous substances employed by physicians and surgeons in the treatment of diseases is very difficult is indicated by the many books published on the subject of materia medica. Most of them are devised with a view to lessen the labour of the student and at the same time render his acquisition of a competent knowledge of the subject easy; but it is very doubtful whether any one of those short roads conduct the learner more rapidly to his object than full and complete treatises, such as the works of Pereira and of Wood and Bache. We venture to assert that the United States Dispensatory by Wood and Bache, which may be regarded as the exposition and complement of the United States Pharmacopœia, is a far better text-book on materia medica for American students than any compilation or compendium yet prepared and published to supersede it.

The purpose of a Pharmacopœia is to obtain uniformity or equality of strength and properties in all medicinal compounds within the region for which it is prepared. In the United States the work is carefully revised every ten years by a convention composed of representatives of the pharmaceutists and medical practitioners in all parts of our immense nation. The Pharmacopœia embodies. it may be presumed, the experimental knowledge of the whole profession, and for

this reason is entitled to be respected as the authority on the subject in every part of our country, to the exclusion of every foreign work of analogous character. But there is reason to believe that the Pharmacopœia of the United States is not universally considered the authority by pharmaceutists in all the States. The opii tinctura camphorata, sold in the shops of Boston, Mass., for example, is a different compound from that sold in Philadelphia under the same name, simply because in the latter city the directions of the United States Pharmacopœia are observed, and in Boston a different formula is preferred, in the preparation of the article.

England, Ireland, and Scotland each had its Pharmacopœia, and each differed from the other in the weights and measures employed, and often also in the ingredients of compounds offered to the public under the same name. There was no uniformity. The same prescription compounded in England, Ireland, and Scotland might result in three compounds differing in potency as well as in the ingredients they contained. For the purpose of securing equality of strength and identity of composition in officinal preparations throughout the British islands, the British Pharmacopœia was made to supersede all the others in 1863. The publication of this work, which in many respects is believed to be inferior to the Pharmacopœia of the United States, Dr. Garrod says, in his preface, "rendered it desirable that a text-book should be immediately in the hands of the student and the practitioner of medicine, and hence the second edition of the 'Essentials of Materia Medica and Therapeutics' is now published alone. The author still hopes, in the course of a few months, to bring before the profession a separate volume devoted exclusively to the value of medicines in the treatment of disease, and embracing the whole subject of therapeutics."

The weights employed in the British Pharmacopœia differ from those of any similar work. The pound contains 7000 grains, and is divided into 16 ounces, each weighing 437.5 grains.

Troy weight is used in the Pharmacopœia of the United States. The pound contains 5760 grains, divided into 12 ounces, each weighing 480 grains.

The liquid measure adopted in the British Pharmacopœia differs from the liquid measure of our own Pharmacopœia. The gallon is divided into 8 pints, the pint into 20 ounces, the ounce into 8 drachms, and the drachm into 60 minims. But in the American measure 16 fluidounces make a pint, 8 drachms an ounce, and 60 minims a drachm.

We believe it is important, for obvious reasons, that the Pharmacopœia of the United States should be recognized throughout the country as the authority, the law of the land, if we may use the expression, in strict conformity to which all officinal compounds shall be prepared. All apothecaries and pharmaceutists ought to feel themselves bound in honour to conform to this authority in the preparation of all compounds which are officinal, so that identity of strength and composition shall everywhere prevail.

Inasmuch as the British Pharmacopœia differs in the weights and measures it employs, and in many essential points, from the Pharmacopœia of the United States, we cannot concur in opinion with the American editor of "The Essentials of Materia Medica and Therapeutics," that "The work of Dr. Garrod supplies a want that has long been felt on this side of the Atlantic." We fear the work is calculated to oppose the establishment of that uniformity which it is the purpose of the Pharmacopœia of the United States to obtain; and this objection is not abated by giving the formulæ of both pharmacopœias where they differ in the constituents of a compound, inasmuch as their relative or proportional weights and measures are not the same, even when they agree in component parts. In the latter case, equal measures are not equivalents in dose.

The formula given for tincture of opium by Dr. Garrod, page 175, is, "Powdered opium one ounce and a half [equal to 656.2 grains]; proof spirit one pint. Prepared by maceration. One grain of dry opium is contained in fourteen minims and a half of the tincture." Prepared according to the Pharmacopœia of the United States, in a pint of tincture of opium, 600 grains of the drug are used, and 12.8 minims of the tincture represent one grain of dry opium. The American pint contains 7680, and the British 9600 minims. In the "somewhat copious posological table" (page 419), based on the formulæ of the British

Pharmacopœia, the dose of tinctura opii is stated to be "4 min. to 40 min.;" but it may be shown that 40 minims of the American tincture contain $3_{1}^{1}{}_{6}$ grains, and the British preparation 2_{6}^{4} grains, or a half grain less of opium.

The American editor claims for Dr. Garrod's work, in connection with the notion that it supplies a want long felt on this side of the Atlantic, that "it gives a succinct but accurate account of the natural history, of the physical and chemical properties of the articles of the materia medica, and of the adulterations to which they are frequently subjected (in England); the physiological action and the therapeutic action of medicines are very concisely given, but the absence of confused and sometimes contradictory details is often an advantage to the student."

In all these particulars, the work before us is like that of the late Dr. J. Forbes Royle, the predecessor of Dr. Garrod in the professional chair of materia medica and therapeutics in King's College, London, but generally inferior to it. The volume of Dr. Royle, ably edited by Dr. J. Carson, was reprinted in Philadelphia, and has been accessible to the members of the medical profession in the United States since 1847. Besides, there has been no dearth of compendious works on materia medica, which are in accordance with our own Pharmacopœia, prepared expressly for the use of medical students. Had the American edition of Dr. Garrod's work contained the formulæ of the United States Pharmacopœia exclusively, without any quotations from or references to the British, London or other pharmacopœias, it would be a much more eligible hand-book or compilation of the subject than it is at present for Americans. The propriety of teaching English students the materia medica, with the weights and measures, and formulæ, according to the Pharmacopœia of the United States in the foreground, and those of the British Pharmacopœia in a secondary position, is the same as offering to instruct American students on the subject from a book in which our own Pharmacopœia is made to occupy a secondary place. British students who are expected to practise medicine in conformity to the British Pharmacopœia, have no need to be made acquainted with the weights, measures, and formulæ of the American Pharmacopœia; and we venture the opinion, that medical practitioners on this side of the Atlantic will not find it necessary to employ British weights, measures, and formulæ instead of our own, and therefore a knowledge of them is to be regarded here simply as a scholarly accomplishment.

Dr. Garrod designed that this volume should serve as a text-book to his own lectures and examinations on materia medica, and be as brief as possible, without omitting anything essential to the British practitioner. This being his self-imposed task, it may be said, he has done his work fairly, and that his pupils will find in this compilation valuable assistance in their studies.

A commendable feature of the volume is, that it embraces formulæ for test and volumetric solutions, with an explanation of their application in analyses of substances contained in the British Pharmacopœia. The table of contents exhibits his systematic arrangement of the subject, and the index is full.

We are not aware of his reasons for spelling the German word fusel, "fousel;" or why he should write "Hæmatoxylum" for Hæmatoxylon, which is the usual orthography.

The mechanical execution of the work is satisfactory, and to those who desire to learn wherein the British and American Pharmacopœias differ, will find this volume useful.

W. S. W. R.

ART. XXVII.—*Lectures on the Diseases of the Stomach, with an Introduction on its Anatomy and Physiology.* By WILLIAM BRINTON, M.D., F.R.S., Physician to St. Thomas' Hospital. From the Second London Edition. 8vo. pp. 302. Philadelphia: Lea & Blanchard, 1865.

HAVING so recently (See No. for April, 1865) reviewed the English edition of this work, it is sufficient on this occasion to announce the appearance of a neatly gotten up American reprint, and to express our pleasure that this instructive volume is now placed within reach of the profession in this country.

ART. XXVIII.—*A Report upon the Epidemic occurring at Maplewood Young Ladies' Institute, Pittsfield, Mass., in July and August*, 1864: *Including a Discussion of the Causes of Typhoid Fever.* By A. B. PALMER, M. D., Prof. of Pathology, etc. in the University of Michigan, and of Pathology and Practice of Medicine in Berkshire Med. College; and C. L. FORD, M. D., Prof. of Anat. and Physiology in the University of Michigan and Berkshire Med. Coll.; and PLINY EARLE, M. D., Prof. of Anat., Med., and Hygiene in Berkshire Med. Coll., and Superintendent of the State Hospital for the Insane at Northampton, Mass. 8vo. pp. 36. Boston: 1865.

THE chief interest of this very able report consists in the important bearing the facts it embraces have upon the causes by which a severe local outbreak of typhoid fever may be induced.

It appears that during the latter part of July, 1864, five of the inmates of a well-established and popular ladies' boarding-school, located in one of the most elevated, and, in common estimation, one of the most healthy places in Western Massachusetts, and which at the time was free from any unusual sickness, became indisposed. During some eighteen days up to the 10th of August, when the school closed for the summer, about thirty more of the inmates were sufficiently indisposed to require medical advice. The resident pupils were 77. With the Principal and his immediate family, the resident teachers, and servants, the entire population of the school amounted to about 112 persons. There was also in daily attendance quite a number of pupils who boarded and lodged at their own homes.

Of the first five attacked, four died, on respectively the 2d, 3d, 7th, and 10th of August.

At the closing of the school, August 10th, the pupils hastily dispersed, a few leaving before that time. Some were so ill as with difficulty to reach their homes, while others were obliged to stop on the road until their recovery took place.

A week or two after the closing of the school, two of the day scholars and two or three of the servants were attacked in a manner similar to the others, one of whom died. Reports that sickness and death had occurred among those who had left were received, creating in the community no little anxiety and alarm. To determine, if possible, to what cause or causes existing in the school buildings this outbreak of disease was referable, the authors of the report before us were appointed.

After a very thorough and searching investigation, it was ascertained that of 77 resident pupils, 51 had suffered from unquestionable typhoid fever, and in the majority of cases of a severe form and several weeks' continuance. In addition, 9 or 10 had merely premonitory symptoms, which speedily yielded to treatment; one had dysentery, one slow fever, one anæmia, two were merely reported as unwell, and eight as well, both in the school and for a short time after leaving. Of the 51 cases of typhoid fever, occurring among the pupils, 13 terminated fatally, or about 25.5 per cent.

As to the cause of the endemic just referred to, the committee are of opinion that it "originated essentially" in the state of the privies appertaining to the school buildings, and the inefficient and defective drainage of the entire place. The high temperature of the season and other particular atmospheric conditions, developed, they suppose, in the organic materials accumulated in and about the school buildings, a peculiar poison, in sufficient quantity to pervade the whole premises, and operating for a sufficient length of time to produce disease "in young and susceptible persons, rendered probably more than usually impressible by the protracted heat of the summer, the severity of their labour, and, possibly, by other influences belonging to the season, and to their peculiar conditions."

The entire report is well worth a careful and deliberate study. The facts embraced in it, collected from different reliable sources, inculcate an important hygienic lesson—namely, the part, very commonly overlooked, which is played by old, badly-constructed, and ill-kept privy wells in the production of typhus and typhoid fevers, and other diseases of a low type. D. F. C.

ART. XXIX.—*Lectures on Epilepsy, Pain, Paralysis, and certain other Disorders of the Nervous System.* By CHARLES BLAND RADCLIFFE, M. D., F. R. C. P., Physician to the National Hospital for the Paralytic and Epileptic, etc. etc. 12mo. pp. 280. Philadelphia: Lindsay & Blakiston, 1866.

IN our number for July last we gave a full review of this work; and we need merely, therefore, now only refer to the opinion there expressed of its merits, and announce its republication in this country, thus rendering it accessible to American practitioners. We must add that the volume, both as regards paper and printing, presents a very neat appearance.

ART. XXX.—*Patologia e Terapia delle Malattie Veneree di* F. J. BUMSTEAD, Lettore sulle mallattie veneree al Collegio dei Medici e Chirurghi, Nuova York, Chirurgo all' Ospedale San Luca, Chirurgio all' Ospedale Ottalmico di Nuova York. Prima traduzione Italiana del Dottor CIRILLO TAMBURINI, medico assistente presso l'Ospedale Maggiore di Milano; con note ed aggiunte del dottor AMILCARE RICORDI, Chirurgo del comparto speciale delle malattie veneree nell' Ospedale Maggiore di Milano. Due volume, 8vo. pp. 416 e 562. Milano, 1864.

Bumstead's Pathology and Treatment of Venereal Diseases. Translated into the Italian by Dr. Cirillo Tamburini, Assistant Physician to the Maggiore Hospital of Milan, with notes and additions by Dr. Amilcare Ricordo, Surgeon attached to the venereal wards in the same hospital, Milan, 1865.

IT is four years since we first announced the publication of Dr. Bumstead's work on venereal diseases. The high appreciation to which we judged it entitled, has been universally bestowed upon it, both in this and in foreign countries. It is conceded to be the best practical treatise on venereal affections in any language.

Both the surgeons who have undertaken this Italian edition with notes and additions, have most faithfully accomplished their task. The rendering of the English has been done with care, and the additions, which are numerous, and, moreover, all of them valuable, show the practical experience and literary attainments which might be expected in one holding in surgery the position occupied by Dr. Ricordi.

We have experienced much gratification from an examination of this edition of Dr. Bumstead's work, both because it is pleasing that so good a work should be extensively circulated; and that our medical literature should be so worthily represented abroad.

W. F. A.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On Life.*—Dr. Lionel Beale, in a paper read before the British Association for the advancement of Science at its meeting in September last, commenced by remarking that what he said would be both theoretical and hypothetical. The differences between vital and physical agencies were ably discussed, and Spencer's theory, that assimilation and reason were life, was skilfully combated. Assimilation was not common to the life of all orders where there was certain vital agency. The author alluded to the various kinds of life, and showed that life could not be disturbed or passed through space. The matter in every living cell might be divided into three parts—that which was in a state of life; that which was dead, but had been alive, and that which was lifeless, but would be alive, and after passing through that state would die. The living cell had been compared to a laboratory; but what laboratory was self-serving and self-creating, and what machine could make up waste like the living cell? Dr. Beale noticed the various kinds of life, and proceeded to notice vital movement, in which he remarked that there was no expenditure of force, and alluded to the fact that living matter moves upwards in spite of the attraction of gravitation. The difference between vital power and physical force, and the fact that the one was not attributable to the other, formed the concluding argument of the author.—*Med. Times and Gaz.*, Sept. 23, 1865.

2. *Experiments to determine the Period at which the Spleen is most actively engaged in the Discharge of its Function.*—MM. Estor and St. Pierre, after commenting upon the vagueness of our knowledge of the function of the spleen, remark that only one point is certain, that the spleen undergoes a considerable augmentation in volume in certain physiological conditions, and especially during the act of digestion, whence it has been regarded as simply fulfilling the purpose of a diverticulum. Applying, however, the observations of Bernard, in respect to the change of colour and the quantity of oxygen contained in the venous blood of a quiescent and of an actively secreting gland to the spleen, and from the results of carefully performed analyses, they have arrived at the conclusion that the blood of the splenic vein, during the period of fasting, contains nearly double the proportion of oxygen that is present while gastric digestion is being actively carried on, and consequently that the period of functional activity of the spleen *alternates* with that of the stomach. The mean of six experiments showed that in 100 volumes of *arterial* splenic blood there were contained 14.38 volumes of oxygen, in 100 volumes of the splenic *venous* blood of a fasting animal there were 11.53 volumes of oxygen, and in 100 volumes of the splenic venous blood of an animal in full gastric digestion there were only 5.70 volumes of oxygen.—*Brit. and For. Med.-Chir. Rev.*, Oct. 1865, from *Robin's Journ. de l'Anat. et de la Phys.*, March, 1865.

3. *Deglutition as observed by Autolaryngoscopy.*—M. GUINIER, in a note presented to the Academy of Sciences, arrives at the following conclusions. 1. Deglutition may be effected without occlusion of the pharynx, by the application of the base of the tongue to the posterior wall. 2. The preliminary application of the epiglottis over the larynx is not necessary during the passage of the morsel of food from the pharynx into the œsophagus. 3. The morsel may come into direct contact with the mucous membrane of the glottis; and the mere contraction of the vocal cords is sufficient to prevent it from entering the larynx. 4. The mucous membrane of the base of the tongue, of the epiglottis, and of the interior of the larynx, appears to be endowed with a special sensibility; here the contact of food produces no painful sensation, but merely the need of deglutition, while the contact of a foreign body gives rise to cough or attempts at vomiting.

At the same meeting, a note was presented from Dr. KRISHABER, in which the following conclusions were given: 1. During the act of deglutition, the alimentary morsel passes into one of the pharyngeal grooves along the side of the epiglottis tilted up by the elevation of the larynx; it thus reaches the œsophagus at the moment when, by the action of its constriction, the pharynx is narrowed. 2. Deglutition of liquids is effected in the same way; but they frequently pass over the epiglottis. 3. A small quantity of liquid comes into contact with the mucous membrane of the larynx and even of the vocal cords. 4. In gurgling, the larynx being widely open, a large quantity escapes into the organ. 5. The alimentary morsel is easily tolerated in the larynx as far as the vocal cords and even in the trachea. 6. The sensibility of the trachea to foreign bodies is much less than that of the larynx. 7. Hard cold bodies—a probe for example—are not tolerated in the air-passages; while soft bodies, having a temperature equal to that of the parts with which they come into contact, may remain in the trachea several minutes without producing cough.—*Gazette Médicale de Paris*, July 15, 1865.

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4. *Influence of Galvanism on the Heart.*—Dr. EMILE FLIES, of Berlin, has lately studied, in twenty-four cases, the influence of the constant galvanic stream on the impulse of the heart when increased in frequency and force. In some of the cases, the increase of the heart's action was distinctly traceable to organic disease, and in other cases was probably connected with an increased excitement of the sympathetic nerve-fibres of the heart, which, according to Bezold, act on its musculo-motor central organ, increasing its activity. Starting from the physiological fact, that the vagus fibres of the heart have an action antagonistic to that of the sympathetic—*i. e.*, a depressing influence on the moving power of the organ—he endeavoured to act upon the vagus in the neck at the inner border of the sterno-cleido-mastoid muscle. Dr. Flies found that, after the galvanic current had been employed several times, the intensity of the heart's action was diminished.—*Brit. Med. Journ.*, Sept. 9, 1865, from *Ber. Klin. Woch.*, June 26.

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5. *Experiments on Congelation of Animals.*—M. POUCHET, of Lyons, has communicated to the French Academy of Sciences a long series of experiments made by him on this subject. The following are his conclusions:—

1. One of the first phenomena produced by the action of cold is the constriction of the capillary vessels, immediately made visible by the microscope. So great is the contraction that no globule of blood can gain admission, so that these vessels remain entirely empty, whence the pallor of frozen parts. 2. The next phenomenon is the changed condition of the globules. The alterations observed are of three kinds. (1) The nucleus quits its envelope and swims freely in the plasma, the free nuclei having a granular appearance and being more opaque than in the normal condition. The envelopes of the nuclei become flaccid and torn, or they are dissolved and disappear. (2) The nucleus still remaining within its envelope has become opaque, and is more or less excentrically situated. (3) The globules may be simply more or less indented at their edges and of a deeper colour. It is especially in the blood of reptiles that the nuclei are found expelled, the globules of mammalia presenting indentations. The number of globules which undergo these alterations and re-enter the circulation is propor-

tionate to the extent of the congelation. When this affects only the limbs, $\frac{1}{15}$th or $\frac{1}{60}$th only undergo alteration; but when the animal is totally frozen almost all the globules become disorganized. 3. Any animal that has been totally frozen, all its blood having become solidified and all the globules disorganized, must be regarded as absolutely dead and beyond any restorative power. 4. When the congelation is partial, any organ absolutely frozen becomes gangrenous and is destroyed. 5. If partial congelation has not extended very far, so that but few altered globules have entered the blood, life is not compromised. 6. But when the congelation proceeds over a great extent, the mass of the changed globules which the thawing throws into the circulation rapidly kills the animal. 7. A half-frozen animal may live for a long time if we maintain it in that condition, the frozen blood not entering into circulation; but it dies rapidly if we thaw the frozen parts, the altered globules which re-enter the blood rendering it unfit for the maintenance of life. 8. In all cases of congelation death is due to this change in the blood, and not to the impression made on the nervous system. 9. It results from these facts, that the less rapidly frozen parts are thawed, the less rapid is the invasion of the economy by this altered blood and the greater are the chances of success in the efforts at restoring life.

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6. *Cell-Pathology.*—Dr. J. Hughes Bennett, in a paper read before the British Association for the Advancement of Science at its late annual meeting, stated that cell-pathology had naturally sprung from the cell-theory, as originally framed by its founders, Schleiden and Schwann, which had greatly extended the boundaries of medical science. The cell-pathology of Virchow, however, was based upon a law he sought to establish; viz., that every cell sprang from a pre-existing cell, and that we must not transfer the seat of oval action to any point beyond the cell. This supposed law, he maintained, was opposed by so many histological facts as to be altogether untenable. He begged especially to draw attention to the origin of pus-cells, which Virchow and some of his followers had represented as originating in the interior of connective tissue corpuscles. Dr. Bennett and his pupils had frequently sought, by passing setons through the skin and muscles of animals, to observe in the inflamed tissues the appearances which had been figured in support of Virchow's views, but had never succeeded in seeing pus-cells within pre-existing cells. Henle had pointed out that the error had originated in mistaking the triangular spaces observable, on a transverse section, between the bundles of various fibrous tissues, for cells; as in these, unquestionably, pus was very likely to collect. Dr. Bennett further believed that the tendency of many cells to enlarge as the result of irritation, and to multiply themselves endogenously, as shown by himself, by Roberts, Goodsir, Redfern, and other pathologists, was another source of mistake among the younger histologists. The granules and included cells so formed were mistaken by them for those of pus, though easily separated from them. He called attention to a series of preparations (which were exhibited), showing suppuration in inflamed eyeballs, and in pneumonic lungs, in which pus-cells might be seen in all stages of formation—originating from a coagulated molecular exudation, unconnected with any pre-existing cells whatever. In the sections of lung more especially, the fibrous tissue of the organ surrounding the air-cells might be seen to be quite healthy. In the coagulated exudation, on the other hand, the molecules might be observed at first uniformly filling up the air-vesicle; then formed into masses, varying in size from the twenty-thousandth to the one-thousandth of an inch in diameter. The latter were rounded, and were identical with pus-corpuscles. He believed that these bodies, therefore, were formed by an aggregation of smaller particles or molecules, composed originally of the coagulated exudation. It was certain that, in the situations referred to, they did not originate in pre-existing cells, as no such cells could be seen. If, as might be supposed, they sprang from the epithelial cells lining the chambers of the eye or the air-vesicles, such cells would be seen, enlarged, and containing the pus-bodies. But his preparations and numerous examinations of the part when diseased had proved to him that no such cells were mixed with the exudation, or in any way connected with the formation of pus.—*British Med. Journ.*, Oct. 7, 1865.

MATERIA MEDICA AND PHARMACY.

7. *Danger of Subcutaneous Injections.*—Prof. NASSBAUM, of Munich, has just published an interesting account of an accident which happened to himself. Suffering from neuralgia, he had injected morphia under his own skin more than 2000 times—sometimes to the extent of five grains of morphia in twenty-four hours. Two months ago, he injected two grains of acetate of morphia dissolved in fifteen minims of water, and accidentally sent it direct into a subcutaneous vein instead of into the cellular tissue. He gives a graphic account of his dangerous position for two hours, after which the effect passed off. He has seen similar effects in a smaller degree in two of his patients, and the practical lessons are, that it may be impossible to avoid veins at all times, and one may be punctured unawares, subcutaneous injection should always be done *very slowly*. The effects are so instantaneous that the syringe can be stopped at the first sign of danger, and some of the injected fluid mixed with blood may even be sucked out again by the syringe. It is very remarkable how the effects of the same dose of the same substance differ when directly injected into a vein and mixed with the venous blood, and when they filter into the blood from the cellular tissue through the unbroken coats of the vessels."—*Med. Times and Gaz.*, Sept. 23, 1865.

8. *Physiological Action on Certain of the Amyl Compounds.*—Dr. B. W. RICHARDSON communicated to the British Association for the Advancement of Science at its meeting in September last, a second report on this subject. In his previous report he had studied the action of the nitrite of amyl; in the present he considered amylic alcohol, hydruret of amyl, acetate of amyl, and iodide of amyl. The hydruret is an anæsthetic, and produces symptoms akin to somnambulism. Amylic alcohol (hydrated oxide of amyl) produces, after long administration, insensibility to pain and peculiar rigors, which may be sustained many hours. Acetate of amyl exercises a similar influence; whilst iodide of amyl produces, in addition to the same symptoms, profuse secretion. Each one of the series destroys the voluntary power of the muscles, but not the vis insita; their action seems to be purely on the nervous system, and specially on the centres of motion.

The practical conclusions to which the author had arrived were three in number, but we are able only to notice them in the briefest manner, omitting the reasons on which they were based. First, he thought that none of these bodies were safe as anæsthetics; they would not replace ether and chloroform, but they, especially the iodide, might be employed in tetanus with promise of good. Secondly, the investigation taught a useful lesson in regard to the alliance of the symptoms produced with the symptoms of various diseases. It was possible that in some diseases analogous compounds were formed in the body from amylaceous matter under the influence of perverted chemical action. Thirdly, the experiments were of great moment, as indicating how the substitution of one element for another in an organic compound modifies the action of such organic substance on the body.—*Med. Times and Gaz.*, Sept. 30, 1865.

9. *Modification in Canquoin's Caustic Paste.*—This valuable caustic would be still more employed were its application not somewhat difficult; and one of M. Demarquay's pupils has contrived a modification in its composition which renders its application very easy and effectual. The paste thus formed consists of chloride of zinc ten, flour twenty, and glycerine four parts. So prepared, it can be applied to the part to be destroyed with great facility, however varied this may be in shape or direction, and can as easily be washed away. M. Demarquay has frequently employed it, and finds the paste thus prepared with glycerine instead of water far preferable, both with respect to its application and the results.—*Med. Times and Gaz.*, Dec. 2, 1865, from *Bull. de Thérap.*, Sept. 15.

10. *New Anæsthetic Mixture.*—M. BAKER BROWN, Jr., exhibited to the Obstetrical Society of London (Oct. 4) a preparation of two parts of chloroform with

one of alcohol to which the distilled essence of eau de Cologne had been added, which he had found to allay the pain of labour without complete anæsthesia, and recited cases in which it had been used.—*Med. Times & Gaz.*, Nov. 11, '65.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

11. *The Use of the Thermometer in Acute Disease.*—In the *Lancet* (Nov. 4, 1865) we find the following interesting clinical remarks on the use of the thermometer in medical diagnosis, by Dr. SIDNEY RINGER.

"During acute inflammations of any of the tissues of the body, the temperature is always abnormally elevated, often greatly so. Not unfrequently it rises from 98° or 99° (the normal temperature in the axilla) to 103° or 105° F. The amount of elevation is proportionate to the intensity of the inflammation, and thus the temperature measures its intensity and duration. In acute Bright's disease (acute inflammation of the kidney), we have such an elevation of the temperature of the body, and thus we are able in such cases, by means of the temperature, to estimate exactly the duration and intensity of the inflammation. When the inflammation ceases the temperature becomes normal, and is not elevated by those chronic changes that follow in the kidney the acute inflammation. In many cases of acute Bright's disease, long after the temperature has become normal, and, consequently, after the inflammation has ceased, blood continues to pass with the urine from the kidneys. This continuance of the blood in the urine is very generally received as evidence of the continuance of the acute inflammation, and the patient is often cupped over the loins, and low diet given, with the hope of lowering this imaginary inflammation. But no such conclusion can be arrived at from the presence of blood in the urine; and such a conclusion sometimes misleads the medical man, and causes him to adopt a course of treatment at least useless. But such treatment has a positive injurious influence on the chronic disease. For this chronic disease following the acute is chiefly due to the previous impaired health of the patient. If this has been good, in most cases no chronic disease follows; but if the patient's health has been broken down from any cause the chronic disease is very apt to follow on the acute. Thus any treatment that will still further increase the anæmia, or otherwise lessen the nutrition of the body, is liable to produce chronic changes in the kidney or to greatly prolong their duration. Thus such treatment should be carefully avoided. It is in accordance (Dr. Ringer said) with his experience that, on the cessation of the acute stage, the passage of blood and other evidences of the chronic disease are best treated by those means and medicines that tend to promote most perfectly the nutrition of the body. Hence, as the treatments of the acute and chronic inflammation of the kidney are thus often opposed, it becomes of importance to ascertain the most valuable symptom by means of which we can learn when the acute stage has ended and the chronic begun. The temperature of the body gives us the most important information, and it is superior to all the other symptoms, as it is the only constant one. The next in value is the quantity of urine, for, generally, when the acute stage ends the quantity of urine greatly increases; but there are many exceptions to this rule, whilst in all cases, at the termination of the acute stage, the temperature becomes normal.

"The amount of anasarca is greatly determined by the amount of anæmia existing. Thus if the anæmia be marked, the anasarca is great. In many cases during the acute stage and commencement of the chronic there is no anasarca; but as the anæmia progresses, the anasarca is developed and much increased. This symptom is thus best treated by those means which promote the nutrition of the body, both by directly lessening the anæmia and by assisting to restore the kidney to its healthy state. Warm baths and purgatives during the chronic stage should be used with caution, as they easily cause great anæmia and impair

the nutrition of the body. The amount of anasarca must not determine their use, but rather the amount of urine and the drowsiness of the patient. General anasarca appearing suddenly is due either to acute Bright's disease or sudden loss of a considerable amount of blood. If the latter has occurred, it can be at once ascertained. Thus in cases with sudden appearance of anasarca the diagnosis is mostly easy. It is true that cases are met with in which patients become rapidly anasarcous whose urine is quite normal; but in such cases the temperature is normal, and the anasarca has lasted several days. The acute stage, in fact, is over; for not unfrequently in cases of acute Bright's disease, immediately the temperature falls, the urine becomes healthy, the blood and albumen disappearing in the course of a few hours. The blood in the urine, after the inflammation has ceased, is not so grave a symptom as albumen—the latter being more significant of the chronic disease; the former being probably due to some capillaries remaining open and allowing blood to pass out. At least, practically it is found that blood mostly ceases shortly, and the kidney recovers quickly; whilst if the albumen be large in quantity, the kidneys are slow in recovering. Thus if the amount of albumen be not greater than can be accounted for by the blood present, the prognosis is not bad; but if the quantity of albumen be large, the prognosis is more grave, and each day it continues adds greatly to the seriousness of the prognosis. It must be recollected that the urine may be very deeply tinged with blood, and yet very little albumen be present; in other words, a small amount of blood may cause a very red colour of the urine. The duration of the acute stage, measured by the temperature of the body, is usually three to six days. Patients very rarely die during the acute stage. It is the chronic disease which follows that destroys life. Thus it is evident that it is important to determine when the acute stage has ended, that such treatment may be adopted to prevent the chronic disease. The temperature of the body affords the easiest way of ascertaining this; for though great information may be obtained from the other symptoms, such as the pulse, tongue, appetite, &c., still these are not constant; whilst, as has been already stated, the temperature is always elevated whilst the acute inflammation lasts, and becomes normal when the inflammation ceases. It is important also to bear in mind that the continuance of blood in the urine is not a proof of the continuance of the acute inflammation."

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12. *Hydatids of the Liver, their Diagnosis, their Dangers, and their Treatment.*—Dr. MURCHISON read an elaborate paper on this subject before the Medical Society of London (Oct. 16, 1865). It commenced with a report of twenty cases, including all that had been the subject of post-mortem examination at the Middlesex Hospital during the last eleven years, and others that had occurred in the author's own practice. In the course of the paper also, reference was made to all the cases recorded in the Pathological Transactions and others in the medical journals. Dr. Murchison pointed out that, owing to the sudden termination of fatal cases of hydatid disease, hospital records hardly gave a fair view of the ratio of deaths from this cause. Although there could be no doubt that an hydatid cyst might become arrested in its growth, shrivel up, and undergo what is called a spontaneous cure, this result rarely happened when the tumour was large enough to be diagnosed during life. In the large majority of cases it went on increasing, and ultimately burst, and when this happened death was the usual result. Attention was directed to the remarkably latent character of hydatid tumours of the liver: in most cases they gave rise to no uneasiness until they had attained such a size as to compress adjoining organs, or until they were on the point of bursting, and peritoneal inflammation was excited on their surface. The directions in which an hydatid tumour of the liver might burst were various. 1. Into the cavity of the chest. 2. Into the peritoneum. 3. Through the abdominal parietes or lower intercostal spaces. 4. Into the stomach or intestine. 5. Into the bile-duct. 6. Into the vena cava inferior. Independently of rupture, hydatids might destroy life—1st. By compressing important organs and interfering with their functions. 2d. By suppuration of the cyst, or external to the cyst, and pyæmia. 3d. By the formation of secondary hydatid tumours in different parts of the body. It followed that the risks to

which a person with a large hydatid tumour of the liver was liable were many, and the chances of his escaping them were few. Although the tumour might remain stationary for years, an accident might at any moment cause death. Turning to treatment, little benefit could be expected from medicines. Chloride of sodium and iodide of potassium, the two most vaunted remedies, were of no use. It was difficult to conceive how chloride of sodium could destroy an hydatid, seeing that hydatid fluid always contained such a large amount of this salt, which, indeed, appeared to be essential to the life of the parasite. With regard to iodide of potassium, there was not only no proof that it could cause absorption of an hydatid, but there was positive evidence that the drug never reached the hydatid. Not a trace of iodine could be discovered in the hydatid fluid of a patient of Dr. Murchison's who had taken fifteen grains of iodide of potassium daily for several weeks before. Puncture of the cyst was of much greater promise, and had been attended with great success. The dangers were peritonitis and suppuration of the cyst, but by the employment of a fine trocar these dangers might in a great measure be avoided. The error of using a large trocar, or of making an incision with a scalpel, lay at the root of most of the accidents that had occurred. The evacuation of the fluid through a fine canula sufficed to destroy the life of the hydatid. Of twenty cases of hydatid tumour of the liver tapped as described, and collected by the author, all but three had recovered; and of the three fatal cases, death in one was due to secondary tumours, in a second to a miscarriage, and in the third case the cyst had suppurated and the patient was moribund at the time of the operation. In all cases, therefore, where an hydatid tumour of the liver was large enough to be diagnosed during life, and was increasing in size, the operation of puncture and evacuation of the cyst in the manner described was advisable. But before resorting to puncture, it was of course necessary to be certain of the nature of the tumour. The diseases most liable to be mistaken for hydatid tumours of the liver were, abscess of the liver, a distended gall-bladder, extensive effusion into the right pleura, an aneurism of the aorta or of the hepatic artery, and cancer of the liver. The points of diagnosis from these lesions were carefully considered, but the author believed that what was called "hydatid vibration" was a sign of little importance in diagnosis. In a doubtful case there could be no objection to making an exploratory puncture of the tumour. If the tumour was hydatid the fluid drawn off would at once reveal its nature, even if it contained no echinococci. Hydatid fluid was clear and colourless as water; it had a specific gravity of 1009 or 1010; and it contained not a trace of albumen, but a large quantity of chloride of sodium: these characters applied to no other fluid in the human body, whether healthy or morbid. If the tumour turned out to be cancer, or even aneurism, there was ample evidence that no harm would result from a minute puncture. The paper concluded with the details of a case under the author's care, where paracentesis had been performed with complete success. The patient at the end of a year was in perfect health.—*Lancet*, Nov. 4, 1865.

13. *Children's Diseases.*—M. Roger, of the Hôpital des Enfants-Malades, in a clinical lecture on the Diseases of Children, remarked:—

Infantile pathology presents marked differences from the pathology of other periods of life.

1. The newly-born child and the infant at the breast have their special diseases—erysipelas of the umbilicus, scleroma, hydrocephalus; and, a little later, thymic asthma or spasm of the glottis.

2. Some affections, which are rare in adults, are so common in children as to be regarded as peculiar to the first period of existence; for example, convulsions and spasms, hooping-cough, croup, rickets, scrofula, and worms.

3. Then, again, certain diseases which are common at all ages, have a special character in the young. Thus, in them we meet with lobular instead of lobar pneumonia; with tubercles generally distributed, instead of localized in the lungs; and with bronchial phthisis, tubercular meningitis, etc.

4. The phenomenal expression of diseases, again, is distinct. The slightest affection in the child may be ushered in with apparently the most serious symp-

toms. In consequence of the child's highly impressionable nervous system, any inflammation may be attended with spasms, and thus simple laryngitis takes a stridulous or croupy form. Fevers may be attended with convulsions, and any disease may begin with vomiting. The accidents attending dentition, follicular enteritis, or infantile cholera, frequently coexist with the cerebral type.

5. The diseases of children, on the other hand, are, like those of old age, often latent. In old age, we often find irreparable damage done by disease before its existence is manifested; so likewise do we see tubercular meningitis often begin with trifling ailment. Affections of the heart may increase from day to day, and yet scarcely disturb its function. How often have we had occasion to note the *bruit* characteristic of incurable endocarditis in children who present the appearance of most perfect health. Eruptive fevers and other diseases often appear without any marked prodromata. We have often found, at the autopsy, an extensive empyema, or hepatization of a lung, in cases in which no symptoms of these affections appeared during life.

Hence, then, there are special difficulties to be met in the diagnosis of infantile diseases. But these difficulties have been exaggerated. We must not, as some would have us, look at infantile pathology as a mass of medical enigmas, of which specialists alone possess the key.

More than this, I maintain that there are some cases in which the diagnosis is easier in children than in adults. Thus, for example, suppose hemiplegia suddenly to appear in a child, what is the cause? Cerebral hemorrhage? Very probably not; for apoplexy, common in old age, is exceptional in childhood. Is it softening of the brain? No; for softening of the brain, also a disease of old age, is in the child almost symptomatic of cerebral tumour. Syphilitic exostosis, again? No; for tertiary syphilis is unknown in infancy. And cancerous tumours are most rare. But there is a morbid product which is very common in early life, and frequently developed in the nervous system of the young; and that is tubercle. Other examples might be given to show that in the child the elements of the pathological problem are often more simple and easy of solution than in the adult and in old age.

The progress of infantile diseases is often rapid. In a few hours, fatal changes may be effected. The little patient, therefore, should be frequently visited. Dr. West recommends that, in the practice in large towns, three or four visits a day should be made, and even more. For the most serious cases, the advice is good; and, as for others, the position, critical or other of the patient, must be considered, and also the purse of our clients. Too many visits are, however, better than too few, both for the patient's sake and your own. Your reserve or delicacy in this particular may be regarded as neglect, if the patient die; whilst, if he recovers, the excess of your visits may be set down to devotion to your duties. This last piece of advice is, believe me, founded on practical experience.

Certain qualities are required in the child's doctor. He should be sagacious, quick of judgment, patient, and gentle. He should have the art of approaching and addressing children, of using their language, and entering their play. He should be fond of children; and, if he has any of his own, he will more quickly find his way to the hearts of mothers. He should, as was said of Guersant, and as might be said of M. Blache, have a maternal heart. The physician should always possess the sentiment of compassion for his little patients, so well expressed by Rousseau. "Is there a being in the world more feeble, more wretched, more at the mercy of others, which more demands our pity, than an infant?" The diseases of infancy should appeal to the heart as well as to the skill of the physician.—*Brit. Med. Journ.*, Sept. 23, 1865.

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14. *Aphthæ of the Mouth and Throat, with Sickness and Diarrhœa in Adults.*—Dr. WILKS states that he has seen during the last few months several cases of this kind which were so alike in their general features as to be deserving of a special position by themselves. He furnishes the following notes of some of his cases:—

One of the earliest and most severe cases which I witnessed was that of a young man in consultation with Dr. Waterworth, of New Kent-road. I found the patient sitting up in bed dreadfully ill, making ineffectual attempts either to

hawk up tenacious secretion from his throat or to swallow it. It was evident that his great trouble was in his throat; this was with difficulty examined, as its extreme irritability produced a constant dread of vomiting. The whole mucous membrane was of a deep red color, covered with white specks, patches, and tenacious mucus; indeed, it was in a state which might be called follicular stomatitis, or even thrush—using the term in its most general sense. There was also considerable extension of the malady down the bronchial tubes, as evidenced by the râles and the tenacious expectoration. He had already got much thinner, and his pulse was very rapid and feeble. He had constant sickness and diarrhœa. It should be said also that the secretion from the mouth was very fetid. If an examination of the throat had not shown an absence of false membrane, the case in other respects might have been regarded as one of diphtheria, judging from the extreme illness of the patient. Supporting remedies were evidently indicated, but they were taken with much trouble. He remained very ill for about two weeks, and then gradually recovered, but has scarcely regained his strength at the present time.

Another case was the daughter of a surgical instrument maker living at Lewisham. She was suddenly taken ill with severe febrile symptoms, and soon became affected with a very bad mouth and throat resembling the aphthous condition seen in children. She also had constant sickness and frequent diarrhœa; the skin was hot, and the pulse very quick and thready. After a few days the urgent symptoms passed off, but great prostration remained for a long time, and the disposition to sickness and diarrhœa continued for some weeks. She is now in a very precarious state.

A third case, somewhat resembling these. I saw with Dr. Butler, of Woolwich; the onset of the case was marked by delirium: but here the bronchitis was more severe, and the patient died in a very few days.

Another fatal case, with similar symptoms, I attended at Camberwell, with Mr. Lacey, but here the young man had been very dissipated, and had much mental depression, so that his previous condition may have had much to do with the result. The matter expectorated in this case was so offensive that the house was scarcely bearable, and suggested gangrene of the lungs, but of this there were no physical signs.

A lady at Croydon, after having a severe illness of a similar character to those mentioned above, suffered some time with stomatitis and bronchitis, and then gradually recovered.

I have within the last few days seen a sixth case at Rotherhithe for the second time. A young woman was taken suddenly ill with rigors, and in a few days was in an extremely critical condition. She had the same follicular stomatitis as in the other cases, the mucous membrane being of a deep red colour, and covered with white spots and patches of secretion. It was so painful that she could scarcely swallow; at the same time there was very frequent vomiting and much diarrhœa. After being very depressed for some days, and giving her friends and the medical man much anxiety about the result, she slowly began to improve.

If one had witnessed but a single instance of this kind, the disease might have been attributed to some special exciting or individual causes; but when half-a-dozen cases of a malady come before the same practitioner, and present the same symptoms, he cannot but regard them as examples of a particular type of disease. I believe, therefore, that I am witnessing a malady which cannot be referred to any one name in the category of disease. It has points of affinity with diphtheria; and, indeed, if the latter term can be used in a larger sense than that which implies the presence of a membrane, it is possible that very similar causes may be in operation for the production of the two diseases. I have used, as a conventional expression, the term "gastro-enterite" on the supposition that the whole mucous membrane of the alimentary canal was in a state of morbid action. This French expression I have never before adopted except in the case of children, in whom it is a convenient one; and, in speaking of children, I think I cannot better explain the form of malady to which I wish to draw attention than by saying it almost exactly resembles that which medical men are in the habit of witnessing in infants, but transferred to

adults. I refer to the very common cases of infants who from error in diet or unknown causes, rapidly fall away in flesh, have vomiting, purging, and an aphthous state of mouth. In such cases, the nurse's opinion that the thrush has gone "through them" is not altogether erroneous, for I have seen the stomach and intestines show evident signs of morbid action, and the œsophagus covered with an adherent white secretion like that of the mouth, and corresponding very closely to a plate given in Cruveilhier's "Morbid Anatomy" under the head of "Muguet."—*Med. Times & Gaz.*, Sept. 2, 1865.

15. *Malignant Pustule.*—At the meeting of the Academy of Sciences on June 19th, M. Cl. Bernard presented a paper by M. DAVAINE on the nature of the malignant pustule. The object of the author was to bring forward additional proof of the identity of the disease with the *charbon* of animals, as shown by the presence in both of the filiform organisms called by him *bacteridia*. In September, 1864, he, in conjunction with M. Raimbert, communicated to the Academy a case of malignant pustule in which bacteridia were present; and he now had some additional instances to adduce. Two pustules, removed on the second or third day of their development,[1] were immediately placed in a solution of chromic acid, and thus hardened. On placing very thin sections in a solution of caustic potash, the cutaneous elements were removed while the bacteridia were left. In both instances, these organisms were located in the rete mucosum, underneath the superficial layer of epithelium; they were arranged in groups, separated by collections of normal epithelial cells, with which the masses of bacteridia at their outer part became gradually blended. No other pathological element was discovered in the pustules.

Malignant pustule, M. Davaine observes, is a disease primarily of local origin, and may within the first two or three days, be arrested by removal and by cauterization; but, if this be not done, the constitution becomes affected. This succession of phenomena is explained by the anatomical constitution of the pustule. At first the bacteridia, developed in the non-vascular epidermic tissue, are isolated and may be destroyed; but, if left, they soon reach the true skin, from which they are carried into the circulation by the lymphatics and blood-vessels. In support of this view, M. Davaine relates the case of a man who was admitted into the Hôtel Dieu under M. Grisolle. On June 3d, he perceived a malignant pustule on his neck; and on the 6th he died, in spite of the application of corrosive sublimate and the actual cautery. On *post-mortem* examination, made on June 8th, there was observed: cadaveric rigidity; absence of putrefaction or gangrene; œdema of the subcutaneous cellular tissue of the chest, extending to the mediastina; partial congestion and sanguineous effusion at the apex of the left lung; sanguineous engorgement of the liver; enlargement and softening of the spleen; and black, fluid, diffluent blood in the heart and large vessels. The blood in the heart contained a large number of bacteridia. M. Davaine inoculated a guinea-pig with a drop of this blood: in two days the animal died, and its blood was found to contain an immense number of bacteridia.—*Brit. Med. Journ.*, Sept. 9, 1865, from *Gaz. Méd. de Paris*, July 1, 1865.

16. *Animal Parasite Diseases of the Skin.*—Dr. BALMANNO SQUIRE, in a communication made to the British Medical Association, states that the diseases produced by epizoa "are not only of extremely common occurrence, but are some of them most obstinate. That they are so prevalent, is doubtless owing to their contagiousness; and their character for obstinacy is due solely to their cause, in the majority of instances, having been hitherto unknown.

"Many cases of urticaria, more especially of chronic urticaria, of eczema, of prurigo, of lichen, and of impetigo, or rather of diseases that pass by these names, are as distinct in their etiology and pathology, as well as in the treatment that they require, from cases of these affections properly so-called, as they well can be; since, in place of being of constitutional origin, they depend essentially on the presence of an animal parasite on the skin.

[1] Dr. Mauvezin, says M. Devaine, has in many instances obtained successful results by removing the pustules and cauterizing the wound.

"Often an acute eruption, having apparently all the characters of urticaria, after having been steadily and perseveringly treated as if it were dependent on gastro-intestinal disorder, is found to remain unchanged, or to have become worse, rather than better. No disease is looked on as more hopeless than chronic urticaria; and prurigo senilis has ever been an *opprobrium medicinæ*. These last two diseases, indeed, well deserve the serious attention of all who are engaged in the practice of medicine. They are certainly common enough to render it most desirable that their origin and nature should be generally understood; and they are at least severe enough, both as regards the degree of distress they occasion and the length of time over which their course usually extends, to make it advisable that some more efficient means should be employed for their relief than what are generally thought to be the appropriate remedies for them.

"Many of the most intractable cases of eczema and of impetigo of the scalp—intractable only so long as they are treated on the assumption of their being of constitutional origin—might readily and speedily be got rid of; and many ingenious theories that have been broached on the subject of contagious impetigo might be dispensed with, if the influence exercised by animal parasites in the causation of these diseases were properly appreciated. Many obstinate cases of lichen, too, if separated in like manner from the category of constitutional affections, would be found much more amenable to treatment than they are generally thought to be.

"The limits of a short paper precluding any detail on the etiology, diagnosis, and treatment of this important class of cutaneous diseases, Mr. Squire would only here point out their claims to a more attentive consideration than they have yet received, and mention some of the results at which he had arrived.

"Cases of acute urticaria are sometimes occasioned solely by the presence of the *acarus scabiei* in the epidermis. The author was not aware that this fact had as yet attracted the attention of other observers. He referred to cases where the skin of the person affected, instead of presenting the ordinary appearances of scabies, was covered with a copious eruption of urticaria—apparently, at first sight, the only phenomenon present. There were no signs of gastro-intestinal disturbance; no history either of any previous attack, or of any of the ordinary causes of urticaria having been present. On searching, in these cases, for some other cause, the acarus was discovered, and the condition of the acarian furrows corresponded to the duration of the eruption.

"He had also seen cases of urticaria in which the cause of the eruption had been set down to gastro-intestinal disturbance, but which, as a more careful examination proved, were really produced by the *pulex penetrans*.

"In many cases of scabies, too, he had known a copious eruption of eczema to form so prominent a symptom, that the patient has been treated without success, for chronic eczema; whereas, if its origin had been rightly apprehended, the affection need never have been prolonged sufficiently to entitle it to the name of chronic.

"A large proportion of the cases of eczema and of impetigo of the scalp, that occur in private as well as in public practice, are, the author had had occasion to notice, due to the *pediculus capitis*. At least, this parasite is often present; and, as soon as it is destroyed, the disease ceases, without the employment of any further means.

"Many cases of lichen—affecting the temples and the upper part of the back of the neck—he had found to be due to the same cause.

"The great majority of the cases of chronic urticaria that he had met with, and all cases that he had yet investigated (amounting to a large number) of prurigo senilis, were due to the *pediculus corporis*. The 'prurigo senilis' was not restricted to old persons, though more common with them than with the middle-aged or young; for Mr. Squire had seen it in a child of four years old. Nor did he include under the title the various forms of circumscribed prurigo occurring in old persons, and regarded generally as equally hopeless with prurigo senilis commonly so-called.

"These local varieties of prurigo, though in many cases the result of a lichenous or eczematous affection happening in the localities, are in the majority

of cases merely sympathetic with, and symptomatic of, visceral derangement. Thus, if a careful inquiry be instituted, prurigo podicis will be found to depend on hæmorrhoids, prolapsus ani, fistula or fissure of the rectum, on accumulation of feces in the sigmoid flexure, dysentery, intestinal worms, or the presence of some other irritating cause in some portion of the intestine. Prurigo pudendi muliebris—a no less distressing and inveterate affection—is similarly symptomatic of some abnormal condition of the vagina or uterus; while prurigo scroti is occasioned either by psoriasis or eczema of the part in the great majority of instances."—*Brit. Med. Journ.*, Sept. 2, 1865.

17. *Degeneracy of Vaccine Lymph by Frequent Transmission.*—On this subject the most contradictory opinions have been expressed. Mr. T. M. HARDING has fairly discussed the question in an article in the *Medical Times and Gazette* (Sept. 23, 1865).

He shows that the constitutional manifestions produced by vaccination, either direct from the cow or after a few transmissions as described by the early vaccinators, were much more severe than are observed at the present day from vaccine matter now employed. Hence he thinks it "a fair conclusion that the constitutional symptoms produced by inoculation with matter derived directly from the cow or from persons who have casually derived the disease from the cow are much severer than those produced by the current lymph of the present day."

Mr. H. then inquires whether the protective efficacy of vaccination has diminished?

He states that when vaccination was first introduced by Jenner, that, to demonstrate its efficacy, the vaccinated were exposed to smallpox infection and inoculated with variolous matter, without taking the latter disease. He observes: "If it had been possible in the first few years after 1798 to find one fatal case of smallpox after vaccination, would the operation ever have made way with the public? Yet now it would be easy to find not one, or ten, or a hundred, but thousands of deaths after vaccination. What explanation more rational or more probable can be offered, than that the vaccine virus has undergone some change during its repeated transmissions that has in some way diminished its power, especially when we consider that the local manifestations and constitutional symptoms are also modified, and, in fact, diminished? There is another reason why we should have expected *à priori* that this would occur. Inoculation of smallpox itself is known to be followed by a gradual diminution of intensity, so that in time the matter is no longer capable of producing the disease."

Mr. H. advocates a renewal of the lymph. "I do not recommend," he says, "the general and indiscriminate employment of primary lymph; its effects upon some constitutions are too violent, it requires to be passed through some constitutions properly selected by competent judges before it acquires sufficient mildness to be appropriated for general use. I think that many repeated renewals of lymph could be effected in this way, so as in a short time to completely supersede the lymph now employed, and such a recourse to the parent stock for renewal of lymph may be had periodically, so as to maintain the action of the lymph to the standard of Dr. Jenner. Such a course would materially improve the condition of the people of this kingdom, so far as their immunity from smallpox is concerned; but, after all the care, cases of post-vaccinal smallpox will occur. Let it be remembered, then, that vaccination does not confer an absolute, but a relative, immunity from smallpox, and the more complete the vaccination—that is, as regards the purity and strength of the virus and the number of punctures—the more complete the immunity."

18. *Assimilation of Fat in Consumption.*—Dr. HORACE DOBELL, in his "third report of cases treated with Pancreatic Emulsion" (*Lancet*, Nov. 11 and 18, 1865), offers the following explanation of the frequent failure of our attempts to keep up that favourable change which so often occurs in consumptive cases when cod-liver oil is first administered:—

"We all know how constantly it happens that a consumptive patient makes

remarkable progress for a certain time while taking cod-liver oil, if it is well digested—a progress which might well lead us to hope that it would end in a cure; and we all know equally well how constantly this progress stops at a certain point, beyond which the recovery does not seem able to advance, and from which it too often happens that, sooner or later, a gradual descent takes place. The suggestion I wish to make is, that, assuming a defect to exist in the natural power of digesting and assimilating fats, it would be irrational to expect anything else to happen than that which we witness.

"According to the careful estimate of Dr. Lyon Playfair,[1] the quantity of fat required by an adult in twenty-four hours, to keep up healthy nutrition, is from 1 oz. to 2.5 oz.; and according to the estimate made from very numerous and carefully selected data by Mr. Farrants and myself,[2] the quantity is from 2 oz. to 3.5 oz. We may fairly assume, then, that not less than two ounces of fat per day, on an average, is required to keep up healthy nutrition in an adult. We have next to bear in mind, that before a case of consumption ordinarily attracts attention, and begins to be treated as such, many pounds weight, principally consisting of fat, have been gradually removed from the body. In this condition—1, a deficiency of fat through the organism; 2, a loss of the power to assimilate ordinary fats; 3, a constant demand for two ounces per day, to maintain healthy nutrition—we administer cod-liver oil, in the belief that this form of fat will assimilate when other forms will not. Supposing that it agrees, and that some or all of it is utilized, a rapid improvement takes place in the patient, from the supply of some of that for want of which life was steadily fading—very much as a cut flower that has drooped for want of its supply of sap rallies and recovers freshness for a time when put into water. But there are very few persons who can take more than from half an ounce to one ounce of oil per day—few who can even take this steadily from week to week without intermissions. But supposing an ounce or an ounce and a half per day to be taken regularly, how is this to supply, not only the two ounces per day required for healthy nutrition, but all the extra ounces of arrears that were lost before the treatment was begun? But assuming the possibility of two ounces per day of oil for nutrition, and another two ounces for arrears, being taken and utilized, even then the whole thing may be unstable and may break down, from the fact that we are supplying oil and not solid fat—a body rich in olein and poor in stearin and margarin, in the place of bodies rich in stearin and margarin and poor in olein, such as the fats taken in normal food.

"The practical conclusion from these considerations appears to be, that if we are to give a fair chance of recovery to a patient deprived of the natural powers of digesting and assimilating fats, we must, by one means or another, secure that two ounces of fat of average solidity are utilized every day for the purposes of nutrition, and an additional ounce or two to make up for arrears.

"To obtain this end four principal means are now at our command:—

"1st. The administration of as much oil and fat, either as medicine or food, as the digestive and assimilative powers are still competent to utilize.

"2d. The introduction of fat and oil into the system by rubbing them into the skin of the body and limbs.

"3d. The supply of saccharine and amylaceous articles of food in sufficient quantity to insure that no call shall be made upon the hydro-carbons for elements which can be as well supplied by the carbo-hydrates.

"4th. The introduction of pancreatine and pancreatic emulsions in sufficient quantity to enable the digestive and assimilative organs to utilize the necessary amount of fat."

19. *Inhalation of Oxygen in Phthisis and Anæmia.*—Dr. J. R. Wolff states that Prof. Trousseau, who has experimented largely for the last three years with the inhalation of oxygen, informs me that he found it of no service in any of the stages of tuberculosis; on the contrary, it appears to act as an irritant

[1] The Food of Man in Relation to his Useful Work. 1865.
[2] A Manual of Diet and Regimen. 1864.

in that affection. On the other hand, he found it an invaluable modificator in anæmia, the consequence of excessive uterine hemorrhage, fatigue, protracted bodily and mental suffering, bad alimentation, and nursing—in that anæmic cachexia which cuts off the patient by hectic fever in spite of all treatment. "Many a time," says the eminent Professor of the Hôtel-Dieu, "I had to sigh under a sense of incapacity in dealing with these cases. I have vainly sought for a remedy against them, and I owe it to the labours of my friend and colleague M. Demarquay that I have in many cases been able to recall to life patients whom I have considered as past all help."[1] The remedy consists in making the patient inhale pure oxygen from a caoutchouc apparatus made for the purpose. The quantity inhaled is about six or ten quarts per day. As an illustration, he gives the history of a patient whose appearance was cadaveric, with a pulse from 120 to 130, dry skin, anorexia, who could not sit up for a moment without falling into syncope, but who was cured by the inhalation of oxygen, after iron and tonics had failed.[2] The remarkable feature of that remedy is, that every inspiration of the gas produces in the chest a feeling of agreeable freshness, and the pulse falls eight beats after two or three inhalations, the appetite is revived, and digestion is facilitated.—*Med. Times and Gaz.*, Nov. 25, 1865.

20. *Use of Phenic Acid for the Cure of Phthisis.*—Dr. WOLFF, in an article in the *Med. Times and Gaz.* (Nov. 25, 1865), observes: "Some two years ago the eminent physiologist, Prof. Longet, who had an attack of hæmoptysis with tuberculosis, made some experiments upon himself with phenic (carbolic) acid, by which he was greatly benefited. It is owing to the favourable report of that distinguished patient that this substance is now largely employed by some of the French physicians. Dr. Labori, of the Convalescent Hospital (L'Asile Impériale de Vincennes), has told me that he administered it to between 200 and 300 patients in different stages of phthisis, with most favourable results. The mode of administration is as follows: fifteen drops of the pure acid are dissolved in ʒij of spirits, and the solution mixed with ʒxxxij of water. This quantity is administered daily, partly by the stomach and partly by the inhalation of the fluid in a pulverized state."

For the administration of this fluid in a pulverized state, the Néphogène constructed by Mathieu, of Paris, a more simple instrument made by Lüer, of Paris, or that by Messrs. Weiss & Krohne, of London, may be employed.

21. *Instantaneous Cure of Coryza.*—An Army Surgeon, M. LUC, seized with very bad coryza, attended by fever, severe cephalalgia, and excessive secretion, determined upon trying the effect of inhalation of iodine vapour. The coryza first appeared at 9 A. M., and the inhalations were commenced at 3 P. M., being repeated every three minutes during an hour, each lasting about a minute. The headache was first relieved, the sneezing then occurring seldomer, the amount of secretion diminishing, and by 6 P. M. all traces of the coryza had disappeared, except a little burning sensation in the throat. Several of the officers have since tried the means with the same results. The inhalation is effected by placing a bottle of tincture under the nose, the hand supplying warmth enough to vaporize the iodine.—*Med. Times & Gaz.*, Nov. 11, 1865.

22. *Bronzing of the Skin for Seven Years—Disease of Supra-renal Capsules.*—A case of this is recorded in the *Medical Times and Gazette* (Oct. 21, 1865) which is particularly interesting from the long duration of the disease. It was confidently predicted before the autopsy that a certain diseased state of the capsules would be found. Whatever relation there may be between the bronzing of the skin, or rather the disease of which this bronzing is the most striking feature, and the disease of the capsules, it is a fact that they are very generally associated.

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[1] "Clinique Médicale de l'Hôtel Dieu de Paris," vol. iii. p. 63. [2] Ibid.

23. *Climacteric Insanity in the Male.*—Dr. Francis Skae gives (*Edinburgh Medical Journal*, September, 1865) the following conclusions as the result of his investigations on this subject:—

"1. That there occurs in men between the ages of 48 and 60 a form of insanity, accompanied by more or less constitutional disturbances, which, in its symptoms, progress, and results, is identical with the insanity met with at the climacteric period in the female, and which may therefore with propriety be called climacteric insanity in the male.

"2. That the symptoms of this form of insanity are so characteristic as to render it easily recognizable.

"3. That this is the most curable form of insanity associated with melancholia which occurs in men, the recoveries being in the ratio of 56.7 per cent.

"4. That the duration of the insanity in curable cases rarely exceeds four months.

"5. That this form of insanity, apart from suicide or organic disease, rarely tends to a fatal termination.

"6. That the most important indications of treatment are—early removal from associations and friends; careful watching; occupation, as especially out-of-door work; nutritious diet; and the judicious administration of narcotics."

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

24. *Osteo-myelitis.*—Dr. J. Fayrer, Prof. of Surgery in the Medical College, Calcutta, makes (*Indian Annals*, Jan. 1865) some interesting remarks on this affection, which has been the subject of several very important original papers in this Journal from some of our army surgeons.

Dr. F. says that he has not been able to satisfy himself thoroughly as to the cause of this affection. For a long time he was disposed to attribute it to the bad sanitary condition of the Indian hospitals. "I am now persuaded that although unfavourable conditions of this character increase the liability, and may, in some instances, determine the occurrence of a disease, which under more favourable circumstances would be absent, yet that these alone are not sufficient to account for a condition which makes its appearance when other cases are doing well, and when other parts of the same wound are perfectly healthy and undergoing vigorous repair. It is not at all unusual to see an amputation in which part of the bone has perished, whilst the soft parts of the stump are healthy, and whilst other surgical cases in the same ward are doing well; the aspect of the cases, generally, in hospital also being favourable.

"Much has been written on the after-conditions and unfavourable results of amputations. Necrosis of the end of the bone, retraction of the soft parts, sloughing, hemorrhage, and other untoward events are fully described; but none of these have I found to be of half so much importance, or to give rise to so much anxiety and so many failures, as the disease which I wish to describe. With reference to the mode of amputating, as a possible cause, I feel satisfied that the disease is not attributable to careless or imperfect division of the periosteum before the bone is sawn across, for I am particularly careful in all cases to divide the periosteum thoroughly with a knife, before applying the saw, in order to avoid fraying, or stripping it from the end of the bone.

"I do not say that this peculiar affection of the bone has been overlooked, but it does not appear to have attracted so much attention as it merits: the short notice it receives in most surgical works, and its absence from the Indian medical periodicals, would indicate that it has not generally been found a common affection.

"In calling attention to what I regard as a very dangerous and not unfrequent pathological result of amputations, I would especially dwell upon one important point, the question of re-amputation, at an early period, above the

next joint, before the bone above the affected one, or the constitution itself, have suffered from septic contamination, and ere the lungs or other internal organs have become the seat of changes which are the almost certain precursors of death.

"Again, in compound fractures I would urge the importance of closely examining and removing any portions of bone that have sustained serious injury to the periosteum or medulla by contact with the ground or other hard substance. It is of course impossible here to indicate the exact extent of injury that should determine the removal of such a portion of bone; but in general terms it may be said that injury to the periosteum, such as causes denudation of the bone, crushing, or comminution of its cancellated texture, being likely to give rise to inflammation therein, may render it more expedient to remove a portion of the bone than to retain it within the wound. I have no wish to advocate unnecessary removal of bone; but speak of a special condition under peculiar local or endemic disadvantages. I am satisfied that osteo-myelitis is liable to follow such accidents insidiously, and am equally satisfied that it is better to anticipate the evil and (with the injured portion of bone) remove the danger.

"The same principles apply with equal force in amputation where symptoms of medullary suppuration make their appearance. In such a case the sooner re-amputation is had recourse to the greater the prospect of saving the patient's life. A nice point for consideration will be the chances of arrest of the mischief and extrusion of the dead portion, as happens in ordinary cases of necrosis and exfoliation. But here it is to be borne in mind that the dangers of systemic poisoning are greater, under the most favourable circumstances, in suppuration and exfoliation of a portion of the interior and medulla of a bone, than in necrosis and exfoliation from the exterior. Risk of life is not to be pushed too far in attempting to save a portion of bone, or even a limb. I would not lay undue stress upon the importance or danger of simple necrosis of a portion of the end of the bone in a stump, even though the inner part of the bone be the part affected; for this takes place frequently enough, and though a serious cause of delay in the healing of the stump, it is not, when limited, necessarily attended with danger to life.

"It is of the diffused suppuration extending from the cut end, up the shaft of the bone in the medulla, infiltrating that tissue with pus and causing death of the inner portion of the bone; in youth up to the epiphysis, later in life, to the very head of the bone itself, with the great attendant dangers of fatal pyæmia, that I urge the importance. It is a notorious fact that purulent infection—pyæmia, septicæmia, or whatever it may be called, is most prone to occur as a result of injuries of bones, and I believe that there is no condition so certain to induce it as osteo-myelitis, or suppuration of the medulla.

"It is, therefore, to be most carefully watched for, and I cannot agree with those authorities, who regard it as difficult of detection, especially after an amputation. Upon the earliest appearance of the symptoms which indicate its advent the bone ought to be at once examined, the medulla should be most carefully looked into. This, like the cortical part of the bone, may perish in part, a line of demarcation may be set up, and the dead portion be thrown off as an entire ring of bone of an irregular shape; but as far as my experience here informs me the tendency to limitation of suppuration in the medulla is very small, whilst extension is most frequent; this, in young persons, may be arrested at the epiphysis, but even there it has a tendency to extend, and later in life the whole bone is liable to be affected, and, if left in contact with the next bone in the articulation, to extend to it also.

"The earliest symptoms of systemic infection should, therefore, be watched for, and when detected the sooner the affected bone is removed the better; and as the most effective mode of doing this is to amputate at, or above the next joint, formidable though the operation may be, it is right I believe to do nothing less.

"I am convinced that I have saved some lives by this treatment, and though it needs firm reliance on the principles on which that treatment is founded to justify one in amputating above the joint when apparently amputation through the shaft of the bone is feasible, and when the patient is suffering from the irrita-

tion of incipient blood poisoning, with the pulse at 140, and with evidence of mischief already developed in the lungs, yet I should feel that in doing so I was substituting a chance of life for a certainty of death, and without hesitation I would give the patient that chance.

"I need hardly say that the operation must not be too long postponed, or it will be too late to save the patient from the effects of blood contamination.

"The proper time for amputation in cases of diffused osteo-myelitis is not difficult to determine. It should be as soon as possible after you have ascertained that the bone is affected; and the mode of arriving at this knowledge is simply the passage of a long probe down the medulla.

"Should it impinge on healthy and bleeding medulla near the surface, you may, if the constitutional symptoms permit, wait and see if nature is about to limit the suppuration and throw off the diseased bone. Such expectations are, in my experience, rarely realized, and the doubt is generally resolved, not in favour of the bone.

"However, this is one of the nice points of discrimination in the treatment, and for which no absolute rules can be laid down. The constitutional signs, the state of the pulse, respiration and temperature, would be important indications of the state of the disease: and they cannot be too carefully studied; a pulse over 120, persistent temperature above 104; bronchial râles, hurried breathing, tenderness over the hypochondria, are symptoms that give rise to serious anxiety on their first appearance, and very speedily decide the fate, if not of the patient, of his limb."

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25. *Treatment of Hereditary Syphilis without Mercury.*—In a paper by Mr. R. W. Dunn read before the Royal Medical and Chirurgical Society (Nov. 14, 1865) the author first narrated the particulars of some cases of hereditary syphilis which had come under his observation at the Farringdon Dispensary, and which he had successfully treated with chlorate of potash, without using mercury in any form whatever. Out of fifty cases which he had thus treated, he had met with only one case of relapse, which readily yielded to a repetition of the same treatment; and three deaths, one child dying of convulsions, and the other two being in a dying state when first seen by him. The author then entered upon the general treatment of syphilis, briefly alluding to, and giving the names of, those who have advocated the non-mercurial treatment. On the authority of the *British and Foreign Medico-Chirurgical Review*, he stated that from 1800 to 1835 about 80,000 cases of syphilis had been treated without mercury. He rejoiced in the belief that non-mercurial treatment was gaining ground amongst the profession; and owing to having been so often disappointed himself in the results of specific treatment, he had now abandoned completely the use of mercury in any form in the general treatment of syphilis. In the treatment of hereditary syphilis, he considered that we must be guided by the same general rules which we observe in treating other diseases. All remedies of a depressing or lowering character ought to be avoided; and, on the other hand, tonics, cod-liver oil, strict diet, and extreme cleanliness, were essential to successful treatment. He bore evidence to the marvellous effects upon children of chlorate of potash in combination with hydrochloric acid in this disease. Where the skin was very irritable, he recommended a bran bath, the bowels to be carefully regulated, and the child to be out in the pure air as much as possible. Sixty-three days was the longest period any child had been under his treatment, and eighteen days the shortest, the average time being about thirty days.

Mr. Henry Lee said that if the experience of other practitioners confirmed the results mentioned by Mr. Dunn, it would leave nothing to be desired with regard to the treatment of syphilis. Unfortunately, however, such was not the case. Out of the number of instances that Mr. Dunn had referred to, a relapse was recorded in one case only; and the death-rate of infantile syphilis was as low as 6 per cent. These results proved too much. They were altogether at variance with the experience of those who treated this disease either with or without mercury. Thus, for instance, we are informed in Professor Boeck's published work that out of forty-two children treated by him without mercury, twenty-two died; and these cases were independent of those who died without

undergoing the process of treatment recommended by Dr. Boeck. Some rational explanation must, therefore, be sought for the great difference observed in Mr. Dunn's cases, and where the history of the patients could be traced for a longer period; and this he (Mr. Lee) believed would be found in the fact that in dispensary practice, when mothers found their children not progressing satisfactorily, they took them elsewhere, and in cases of relapse after treatment they would naturally feel inclined to try some other remedy. If the cases thus abstracted from observation were recorded as cures, it would be the means of affording very favourable statistical returns under any mode of treatment. With regard to the treatment of syphilis generally, it constantly happened to him (Mr. Lee) to have patients who presented themselves after four or five years of non-mercurial treatment still uncured, and regretting that they had lost so much time in fruitless attempts to obtain relief; and he also not unfrequently saw some very severe secondary symptoms after the non-mercurial plan of treatment. Indeed, some of the worst cases of secondary sloughing of the throat and of disease of the bones which he had seen occurred amongst those in which no mercury had been used. He therefore thought that, although mercury might be injudiciously given and might then produce injurious effects, the ill-consequences attributed to it in reality very often indeed depended upon other causes. We had now the means of administering this remedy without making any serious demand upon the constitutional powers; and when thus administered, with proper care, it was a most valuable remedy, and certainly not followed by the symptoms which had been attributed to it. The author of the paper had alluded to the effect of the mother's milk upon a child. Now he (Mr. Lee) did not believe that any poisonous influence could be conveyed in this way. The health of the mother might be impaired by syphilis, and the milk would become poor in consequence, and the child might be ill-nourished; but this was quite a different thing from the transmission of the syphilitic poison by the milk. It was a law with regard to syphilis, that a person having that disease could with great difficulty, under any circumstances, be again infected. The child of a syphilitic mother would in all probability be itself syphilitic, and it would then be very difficult to conceive that any fresh poison could be conveyed to it. But we had proof that even a healthy child would not be affected in this way. The following case had come under his (Mr. Lee's) observation in St. George's Hospital. The patient was admitted during the summer of last year. She had had two healthy children, the youngest eight months old. She and her husband had been healthy. After her last confinement she took another child to nurse. This child proved to be syphilitic, and died three weeks before the patient's admission into the hospital. Shortly after taking this child to nurse she noticed a sore on the right nipple, which became very hard all round. Six weeks before her admission, this patient had an eruption, presenting all the characters of syphilis, over the body, and her throat became ulcerated. During these six weeks she continued to suckle her own child as she had previously done. She, however, always kept her own child to the left breast, and the other child to the right one. Her child remained perfectly well during the time she continued in the hospital, and was known to have been so in the November following. This patient had recently been confined again, and was attended from St. George's Hospital; and he (Mr. Lee) had reason to believe that the child which she suckled in the summer of 1864 remained healthy at the present time.

Dr. DRYSDALE said he was sorry that the respected Professor Boeck was absent, for he would doubtless have been able to have answered Mr. Lee's question. In his absence, he (Dr. Drysdale) would endeavour to give an answer. It must be remembered that the cases mentioned by the professor in his work included many infants of but a day or two old. Now, in his own experience, such cases were almost uniformly fatal; children who were much affected by this complaint at birth were often too feeble to breathe. The cases brought forward by Mr. Dunn were not in this category. Infants were not brought to the hospital by their mothers until they were three or four weeks old, and all of the cases cited by Mr. Dunn were of that age. It was a great, and he thought, a rather prevalent error to imagine that all syphilitic children were emaciated and cachectic; many of them were plump and well nourished, and the "old man" look was

rather the exception than the rule. There was, then, nothing surprising in Mr. Dunn's success, with the care he had taken with the cases, many of which he (Dr. Drysdale) had seen. The wonder was that these cases should so long have been considered to require a dangerous drug like mercury. He himself, he believed, had been the first to publish a case of infantile syphilis treated without mercury. These facts completed the chain of evidence against mercury in syphilis, since it had been shown by experience of the most extensive kind that the disease in adults was always injured by the drug, instead of being alleviated. Bone disease, if it occurred without mercury, was very rare, since Syme, Weedon Cooke, and Spencer Wells had not seen cases. In fact, the empirical school of treatment of disease was losing its hold on many of the profession, and a six months' course of mercury to cure disease depending on a blood poison would soon be considered an absurdity. Parents much mercurialized were liable to have syphilitic children far more than others.—*Med. Times and Gaz.*, Dec. 2, 1865.

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26. *Traumatic Tetanus successfully treated by Opium Smoking and Internal Administration of Chloroform and Hemp.*—Dr. J. Fayrer, Prof. Surg. Med. Coll. Calcutta, relates (*Edinburgh Medical Journal*, Feb. 1865) the following interesting case of this:—

"Lukham Dass, a Hindoo labourer, aged 24 years, of small but muscular frame, received an incised wound from the sharp edge of a split bamboo, on the outer aspect of the end of the right forefinger. The wound being slight, and the hemorrhage trivial, he took no notice of it. Twelve days after the infliction of the wound, tetanic symptoms made their appearance, a feeling of constriction in the throat, rigidity of the jaws and muscles of the neck. The wound was dressed by a native, with some irritating application, which added to the mischief. Six days after the first appearance of trismus, he was admitted into Dr. Fayrer's ward on the 29th of August, at 7 A.M. Tetanic spasms and the risus sardonicus were then well marked. The mouth could with difficulty be slightly opened, and he was unable to protrude his tongue. The muscles of the extremities were in a state of permanent spasmodic contraction, as were those of the abdomen and back, the trunk being in a state of opisthotonos. The skin was of the natural temperature, and covered with sweat. The pulse quick and compressible. The spasms increased with great violence, lasting for a few seconds, and returning at intervals of five or six minutes. The fits were more violent when the wound on the finger was touched, but a touch anywhere, a breath of air, or the fanning of the punkah, brought on violent spasms. The bowels had not been moved for four days. Urine voided freely.

"*Aug.* 29, 8½ A.M. The two distal phalanges of the right forefinger were amputated. The wound had extended, exposed, and caused necrosis of the bones. The nerve trunks of the part removed were examined under the microscope and found healthy in appearance. After the amputation, which was done under chloroform, the patient became restless, and the spasms recurred with greater violence and frequency than before. Notwithstanding all this, he took, or attempted to take, some sago and milk. An enema of castor oil, turpentine, and assafœtida was administered, and ordered to be repeated every sixth hour. The enema not acting satisfactorily, two drops of croton oil were given; after this the bowels were freely relieved before the evening. He had also been brought under the influence of opium smoke; four grains of that drug having been smoked in a chillum (pipe) every third or fourth hour. With the opium he had been ordered chloroform ♏x, tinct. cannabis indicæ ♏xx, every second hour, with continual applications of ice in the intestine of an animal, to the entire length of the spine.

"30*th*, 8 A.M. He slept at intervals during the night; pulse quick and compressible; pupils not contracted; he seems quieted, but not narcotized by the opium and hemp; bowels have been moved again. The state of the mouth, neck, and rest of the body much as yesterday; spasmodic fits recur every five or six minutes; body bathed in sweat. The treatment to be continued as yesterday, but opium to be smoked every second hour so as to bring him fully under its influence.

"31*st*. The patient feels easier this morning; abdomen comparatively soft;

bowels moved last night; pulse not improved, quick and weak. He can protrude the tongue for about a quarter of an inch. He is made to take beef-tea and port-wine, with sago and milk, and eggs beaten into custard, with wine as frequently as possible, and these are supplemented with beef-tea. Enemata given after the cathartic enema has cleared the bowels out. The muscles of the extremities are rigid, and the whole body is covered with sweat. The chloroform has been increased to ♏xviij each dose, and gr. ij of extract of hemp instead of tincture; the enemata and opium smoking to be continued.

"*Sept.* 1, 8 A.M. Is quite under the influence of opium; pulse quick and compressible; on touching the ligature on the artery in the wound, the patient is thrown into violent spasmodic fits, which last for a few seconds only; the pupils are contracted, and the body covered with sweat.

"5 P.M. Bowels opened thoroughly; body in a state of opisthotonos. The medicines are to be continued, and instead of solid opium he is now to smoke a bazaar preparation of opium made for opium smokers.[1]

"2*d*, 8 A.M. The patient had some sleep during the night. The extreme rigidity of the abdominal muscles is diminished, and the fits recur at longer intervals, of half an hour or more. The pupils are contracted; bowels moved twice in the night. The muscles of the extremities are as rigid as ever; but the trismus is disappearing gradually. He can speak tolerably. He smoked about 34 grains of opium in the form alluded to in the note, during the last twelve hours. The hemp and chloroform as usual. The wound was dressed with the opium lotion.

"3*d*, 8 A.M. Body still in a state of opisthotonos; pupils contracted; body bathed with sweat. Mouth can be opened to the extent of one-fourth of an inch, but the general condition is one of spasm. The remedies, opium smoking, enemata, and ice to the spine, are continued as before.

"4*th*. Had disturbed sleep last night; pupils natural; pulse slow and compressible. Bowels moved twice this morning; the rigidity of the muscles is diminished; the wound of the amputated finger is cicatrizing; the ligatures have come away. The remedies are all continued as usual.

"5*th and* 7*th*. He has improved; the spasms have been less frequent, and less severe; the abdominal muscles much less tense, and he is able to protrude his tongue to the extent of half an inch. The quantity of opinm smoked is about 70 grains daily.

"8*th*. The chloroform and hemp have been slightly increased, as they are beginning apparently to lose their effect. Opium smoked during this day about 50 grains; towards the evening he had a pain in the chest, with cough.

"9*th*, 8 A.M. The pupils much contracted; he is fully under the influence of opium; he is better as to the tetanic condition. The chloroform and hemp reduced to ♏xviij and gr. 1½ every four hours.

"10*th*. Bowels moved freely three times during the night; spasms diminishing; chloroform and hemp discontinued for a time, and tinctura ferri muriatis ♏x ordered to be given every four hours. It was found desirable to give the hemp and chloroform again in the evening. The ice applied to the spine; enemata and opium smoking as before.

"11*th*. Still pain in the chest; bowels moved three times during the night; medicines continued.

"12*th*. The chest is still painful; ordered turpentine stupes. In the evening, as the pain increased, he was ordered opium gr. j, ipecac. gr. ij, every four hours.

"13*th*. Pulse 108, very soft and compressible; body bathed with sweat. The opium and ipecacuanha discontinued; returned to the chloroform and hemp,

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[1] The natives of Bengal generally smoke opium in this form, which they call "goolie." It is prepared in the following manner: The guava leaf is cut into very small pieces, thoroughly dried in the sun or at the fire; an infusion of opium strained, and evaporated over the fire to the consistence of syrup; with this the dried guava leaf is mixed and reduced into a kind of paste. The mass is then divided into small balls or goolies, and each goolie weighs from eight to ten grains, and contains equal parts of opium and guava leaf. When smoked, it is placed on a piece of burning charcoal in the ordinary hubble-bubble or hookah.

and rub the chest, abdomen, and limbs with a liniment of camphor, opium, and chloroform. He smoked about 35 grains of opium since last report.

"14*th*. Had sound sleep last night. He is gradually improving; the body is still in a state of chronic spasm, but it is much less rigid than formerly, and he is able to flex his limbs, open his mouth, speak, and take food easily. The least irritation brings on spasms still. The pains in the chest, no doubt the result of the spasm, are somewhat better. He takes his food fairly; upon an average he disposes of about 80 grains of the opium preparation daily.

"19*th*. He continues to improve; is able to raise himself into a sitting posture, but still the slightest irritation brings back the spasms, though with less violence. The muscular pains are much reduced by friction with anodyne liniment. He was placed on his feet and supported; attempted to walk, but the effort brought on spasm, and the rigidity remained more or less throughout the day.

"20*th*. A gentle current of electric magnetism tried, but it brought on the spasm more violently, and was immediately discontinued. The improvement is now steadily progressing, and he sits up in bed, though with some difficulty. The medicines, ice to the spine, and opium smoking are still continued; he has become fond of the opium, and says he can't do without it.

"30*th*. Doing well. The ice to the spine was discontinued, as it caused a burning pain. The other remedies and diet, which is of a nutritious character, are continued.

"After this the improvement was gradual but sure; but for some time he complained of pain and stiffness in the muscles generally. He gradually regained the power of walking without aid. The medicines were diminished by degrees, and the quantity of opium reduced to half.

"We found on examining him, after he was able to stand erect, and walk, that the spinal column had been curved laterally to a considerable extent at the second, third, and fourth dorsal vertebræ. He had been perfectly straight, and well formed; but now the shoulder is prominent, and his height considerably lessened. The result of the continued muscular spasm has been to distort the spine, and though he has recovered, it is with this deformity.

"He left the hospital on the 11th October, and walked home. He was much emaciated and aged in appearance, as well as altered by the lateral curvature.

"The quantity of opium goolie consumed from the 1st to the 30th September was nearly ʒxlij, which gives an average of 84 grains per diem; of course much of this was lost in smoking, but still the quantity actually inhaled was large.

"*Remarks.*—The above notes of the progress and treatment of a case of traumatic tetanus are very interesting, as they appear to indicate that opium smoking, if freely and persistently continued, has a controlling power over this mysterious disorder, enabling the patient to live through the terrible exhaustion that it produces.[1]

"The results of the treatment of traumatic tetanus, when well developed, have hitherto, in my experience, been most unfortunate, and I cannot but regard this case as a very satisfactory one, as it enables me to feel that I have a more potent remedy at my command than any I have hitherto employed. I believe I have left none of the recognized methods of treatment untried; and in traumatic tetanus, I may say they have all, with the exception of division of the nerve trunk of the wounded part, disappointed me. Some time ago, I treated a case of severe traumatic tetanus, caused by a wound of the ball of the thumb, by section of the median nerve, about the annular ligament, and the result was most satisfactory; but in that case the tetanic symptoms had only recently set in, and no permanently ill effect had been set up in the spinal cord. I believe that though this treatment would frequently be of service if practised early, it is useless if resorted to after the disease has been thoroughly developed for even two or three days. In the case here detailed, however, it had been of much longer duration when the patient came under treatment, and yet the result was satisfactory.

[1] I am indebted to Dr. Gordon, C. B., for the suggestion of treating this case with opium smoking.

"It may be said that the large and repeated doses of hemp and chloroform, with the ice to the spine, may have been the causes of the curvature; no doubt they were to a certain extent, but I have treated many less severe cases with them, with little other effect than that of promoting euthanasia."

27. *Subcutaneous Section of Carbuncle.*—In June, 1852, Mr. French, surgeon to the St. James's Infirmary, brought before the Medical and Chirurgical Society a plan of treating carbuncle which he had pursued with great success for many years. It consists in the subcutaneous section of the indurated tissue by a tenotomy knife, which is introduced a little beyond the edge of the induration; and, the forefinger of the left hand serving as a guide upon the surface, the tumour is divided just as a tendon would be cut through. The skin itself is left uninjured. If the carbuncle is large, this process is repeated in different positions, so that the mass is crucially divided subcutaneously. We have seen a large number of cases treated by this method. The immediate relief obtained, and the rapid recovery which follows, are very striking. Every surgeon who has practised the old operation of crucial incision knows that it is necessary to cut deeply enough to divide the hardened base of the carbuncle. Mere division of the skin is useless; more than this, it is mischievous, for a widely gaping wound is formed, which is often most troublesome to heal, and leaves eventually a very ugly cicatrix. This is entirely avoided by Mr. French's process.

The following is a case of carbuncle in which Mr. HEATH pursued this plan with the highly satisfactory result recorded:—

Henry W., aged forty-six years, was admitted July 3d, 1865, with a large carbuncle on the back, measuring six inches in diameter each way. This had been coming for ten days, and two days before admission the skin in the centre had given way, exposing a slough, but the surrounding tissue was greatly swollen and inflamed, and he was suffering great agony.

July 4. The patient having been placed under chloroform, Mr. Heath made a crucial subcutaneous section of the carbuncle with a narrow bistoury. The knife was entered at the margin of the inflamed skin, carried well beneath the carbuncle, and the point brought up to the central opening, when the whole thickness of the subcutaneous tissues were divided crucially, the knife being entered four times on account of the large diameter of the carbuncle. The hemorrhage was very free, and was checked by a pad and broad bandage. Low diet; beef-tea, two pints; wine, ten ounces. Aromatic spirit of ammonia, half a drachm; liquor of cinchona, fifteen minims; water, one ounce: three times a day.

5*th*. Passed a good night, the pain being greatly relieved by the incisions. Pad removed. The inflammation has considerably subsided, and a small quantity of pus exudes from each puncture. Poultice.

12*th*. Patient's recovery has been uninterrupted. The inflammation has entirely subsided; the hole in the centre has not increased, and a slough of cellular tissue is now separating.

14*th*. Water-dressing to wound, which is quite clean. Full diet. Dilute nitro-hydrochloric acid, twenty minims; liquor of cinchona, fifteen minims; water, one ounce: three times a day.

21*st*. Convalescent, and on the 25th he was discharged cured.

The same principle has been lately adopted by Mr. Shaw, at the Middlesex Hospital, in some cases of large and exceedingly painful syphilitic nodes upon the tibia. These swellings are sometimes so hard as to give the idea of osseous growths, but they will generally be found to consist of thickened periosteum, rendered extremely tense by a semi-liquid effusion under it. The pain experienced is intimately connected with this tension. The section of the swelling by a tenotomy knife, introduced under the skin and made to cut downwards towards the bone, produces very rapid relief to the suffering, and the disease itself is not rendered thereby less amenable to the curative influence of iodide of potassium, which generally acts so favourably in such cases.—*Lancet*, Oct. 21, 1865.

28. *Enlarged Spleen Removed by Excision.*—Mr. SPENCER WELLS exhibited to the Pathological Society (Nov. 21, 1865) an enlarged spleen removed by

excision the day before the meeting. The patient was going on tolerably well when Mr. Wells saw her (thirty hours after operation) on his way to the meeting.[1] When removed it weighed six lbs. five ounces, but as nine ounces of blood had drained from its vessels, it now weighed five lbs. twelve ounces. It was eleven inches long, eight broad, and three to four thick. It appeared to be simply hypertrophied, though some spots on the surface appeared like commencing amyloid or lardaceous change. It was not cut into, however, as, being the first case in which the operation had been done in this country, it was to be sent to the museum of the College of Surgeons. Mr. Wells added, that when Mr. Nunn showed a large spleen in that room two or three years ago, and he (Mr. Wells) had suggested that the patient's life might possibly have been saved if the spleen had been removed, Dr. Wilks had approved of the suggestion, and he (Mr. Wells) determined to try what could be done if he met with a suitable case. Soon afterwards he attended a lady, with Dr. Jenner, who had a very large spleen; but there was such extreme leukhæmia coexisting that operation was never seriously thought of. The lady died near Bristol, and Mr. Clarke, of Clifton, who examined the body, was specially requested to do so with reference to the removal of the spleen. He informed Mr. Wells that it was done quite easily, and that, in his opinion, all the bloodvessels might have been easily secured. Mr. Wells afterwards saw cases of enlarged spleen with Dr. Budd, Dr. Boulton, of Horncastle, and Dr. Gill, of Bow; but in these cases they were the result of intermittent fever, and not in a state of health to render a hazardous operation necessary or justifiable. At length the patient whose spleen was before the society consulted him six weeks ago. She was married, 34 years of age, and the mother of two children. She had only been ill about a year, and the tumour had only been discovered six months. Its growth had been slow at first, but very rapid lately. Mr. Wells prescribed bromide of potassium and quinine. This proving useless, iron was given; and this being equally useless, excision was proposed, and Dr. Jenner consulted, who said she was dying, that medicine could do no good, while an operation did offer the "*shadow of a chance*" of success. Upon this the patient and her husband desired that the trial should be made. Mr. Wells found the operation quite easy. An incision, seven inches long, was carried along the outer border of the left rectus abdominis, and the spleen was turned out very easily. The vessels were secured by silk ligatures, which were cut off short and returned. There was very little bleeding. The patient had recovered from the shock, there were as yet no signs of peritonitis; and, if she should recover from the operation, all that we know of removal of the healthy spleen in dogs, and in man accidentally by wounds, led to the hope that the absence of the spleen might be tolerated and a good state of health regained.

Dr. Crisp said the case was a very interesting one, but he did not think it was parallel with cases of removal of spleen from dogs. He had, he said, never seen a healthy liver with such a spleen. He thought the liver had more to do with blood formation than the spleen had.—*Med. Times and Gaz.*, Dec. 2, 1865.

29. *Entire Tongue Successfully Removed during Life.*—Mr. Nunneley exhibited to the Pathological Society (Nov. 21, 1865) a specimen of the entire tongue which had been removed ninetcen days before, from a man aged 35, by a submental opening. He never had a bad symptom, and is now quite well. The disease, which had existed sixteen or eighteen months, became worse two months before the operation, and from the pain and difficulty of speaking, the impossibility of mastication, and difficulty of deglutition, was fast wearing the patient out. He has already recovered strength and flesh; indeed, he says that he is as well as he ever was. Talks with great distinctness and swallows with facility.—*Med. Times and Gaz.*, Dec. 2, 1865.

30. *Congenital Luxation of the Patella.*—Mr. William Stokes, brought under notice of the Dublin Pathological Society (Dec. 17, 1864), a case of congenital luxation of the right patella. This deformity occurred in a boy aged

[1] We have since heard that she lived a week, and died of pyæmia, with effusion into both pleural cavities and pericardium, but no hemorrhage nor peritonitis.

nineteen years, who on the 15th of last October applied at the dispensary of the Meath Hospital to obtain relief from a severe pain in the left knee-joint. Upon examining the part, however, Mr. Stokes could not find that there was indication of any local inflammation, or of any other cause for the pain. Wishing to compare the two limbs, he requested the patient to expose the right knee-joint; and on this being done he was struck with the remarkable deformity which it presented, the patella being completely luxated outwards. The patient could give no information as to the cause of this deformity. He stated that he had had it as long as he could remember anything, and that he had never consulted any physician or surgeon with regard to it, as the malformation had never given him any uneasiness, and interfered but little with his progression. From this account Mr. Stokes suspected that the case was one of congenital malformation; and this view was strengthened on carefully examining the joint, for on doing so he found the external condyle of the femur was altogether deficient. This deficiency, then, and the natural anatomical causes for luxation of the patella outwards, appeared to be the two etiological conditions which produced the malformation. The mother of the patient also stated that her son had this condition of the knee from the time of his birth.

Cases of congenital luxation of the patella are of extreme interest in consequence of their great rarity. Since the formation of the Pathological Society of Dublin only two examples of it had been exhibited, both of them by the distinguished Secretary, Professor Smith. In one of them there was, as in the present case, a complete failure of the external condyle of the femur. There was also a congenital luxation of the radius on one side. In Mr. Stokes' case there was no luxation in either of the upper extremities, the congenital malformation being confined to the right knee-joint. Professor Smith had mentioned to him that he had seen, a few years ago, in St. Bartholomew's Hospital, a young lad on whom there existed a congenital luxation of the patella outwards upon each side; but there was, in this instance, no malformation of any of the bones composing either of the articulations.

It was remarkable, when we looked into the literature of the subject, how few instances were recorded of this peculiar deformity.—*Dublin Quarterly Journal Med. Sci.*, May, 1865.

A very interesting case of this deformity is related by Dr. Caswell in the number of this Journal for July, 1865, p. 82.

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31. *Compound Dislocation of the Astragalus—Reduction, with Recovery of a Useful Limb.*—The following case of this, recorded by Dr. JAS. A. GRANT in the *Canada Medical Journal* (Oct. 1865), is remarkable for the recovery of the limb after the very great extent of injury to the joint.

J. M. æt. 35, a robust farmer, while driving a cart, June 24, 1864, in consequence of his horse taking fright, was thrown out with violence and dragged for some distance, his foot catching in the wheel as he fell. He attempted to walk, but was unable, observing that he trod on the outside of the foot, at the same time the suffering was very great. The boot being removed, the following appearances were to be observed. The foot inverted so that the sole looked inwards, tendo-Achillis not tense, the astragalus was driven forwards entirely out of its place, where it took a transverse position, and the anterior extremity protruded fully an inch through the integument on the outer side of the foot. On the upper part of the tarsus the skin was stretched tightly over the displaced astragalus. There was no fracture of either the tibia or fibula. There was very little surrounding effusion, so that the outline of the various parts could be well defined. The dislocated bone was thus wrenched from all of its connections, and thrown transversely across the tarsus. An unsuccessful attempt was made to reduce the dislocation, by extension and pressure. The limb was placed quietly on the bed, and by moderate pressure the bone turned and shot into its place quite unexpectedly. An outside splint was forthwith placed on the leg, and a cold lotion applied over the ankle. An opiate was given at bedtime, and the following day he entered the General Protestant Hospital. The cold water cloths were constantly applied until the 8th day after the accident, and then a purulent discharge from the joint having been observed, a linseed poultice was

substituted. The discharge continued more or less until the end of August, at which time the wound closed perfectly. The limb continued in a weak state until March, 1865; he was then able to throw aside the sticks, and use the limb with considerable freedom.

From this date the parts gained strength, and at present he walks about as well as ever, and performs the various duties of farm life, the limb having regained perfect motion, the parts surrounding the displaced bone resembling in every respect those of a healthy joint.

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32. *Fissured Fracture of the External Table of the Skull produced by a Bullet striking the inside of the Skull.*—Mr. Teevan exhibited to the Medical Society of London (Oct. 16, 1865) a specimen of this, taken from a Swiss who shot himself and died in one of the London hospitals. The bullet entered the right parietal bone, traversed the brain and its membranes, struck the inner surface of the left parietal bone, and remained imprisoned in the cranium. There was no fissure or fracture at the spot on the inner surface of the left parietal bone where the bullet struck, but at the corresponding spot in the outside of the bone there was a starred, fissured fracture of the external table only. Mr. Teevan remarked that this variety of fracture had never been described, and that he brought forward the specimen to corroborate his own experiments on this subject, and in support of the statement which he had made to the Society on a former occasion—that, whether the inside or outside of the skull be struck, fracture of the distal table only, without injury to the proximal one, can be produced in either case, and that such fracture occurs in obedience to a well-known physical law—that fracture commences in the line of extension, which is the distal side, and not in that of compression.—*Lancet*, Nov. 4, 1865.

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33. *Fracture of the Larynx complicated by Œdema Glottidis; Tracheotomy; Recovery.*—The following interesting case of this is related (*Canada Medical Journal*, Sept. 1865) by Dr. Donald Maclean, Lecturer on Clinical Surgery in Qeeen's University.

Wm. Rancier, a farmer, aged 32, married. When first seen [15th June] was propped up in bed in a sitting posture, unable to articulate or perform the act of deglutition, bloody saliva trickling from his mouth, expression of countenance extremely anxious, respiration difficult and stertorous, face, neck, head, and upper part of thorax distended by emphysema, pulse feeble and extremities cold. In reply to my inquiries the following statements were received. Patient had been chasing a dog out of his way while at work in the woods, and while running after the dog and in the act of throwing a stick at it, tripped and fell forward, striking his neck with great violence against a stump, the height of which was sufficient to prevent his hands from reaching the ground.

Making a strong effort, he sprang to his feet and attempted to recover his breath, but he found it impossible to take a full inspiration. On putting his hand to his throat he discovered that it was much swollen, and that the swelling was extending rapidly upwards over the face and back of the head. At the same time blood began to flow pretty freely from his mouth.

All these circumstances conspired to alarm him very much, still with the assistance of a man who had been working with him, he walked to his house, a distance of about two hundred yards. A messenger was at once dispatched for medical aid, and about twelve hours after the accident, I arrived at the patient's residence (which is about twenty miles distant) and found him in the condition I have already described.

On proceeding to manipulate the parts there was no difficulty in discovering that the thyroid cartilage (at least) was fractured, the pomum adami was absent, and crepitus could be distinctly felt; over and above the crepitation of the emphysema, and by pressing on the left ala of the thyroid cartilage, respiration was entirely arrested and acute pain felt. At this time I was of opinion that the cricoid cartilage also was fractured, but at subsequent examinations could never detect the abnormal prominence which on this occasion I supposed to have been produced by fracture of the cricoid. The emphysematous and otherwise unnatural state of the parts of course rendered precise manipulation im-

possible. For the same reason I found it impossible to discover the exact extent and direction of the fracture of the thyroid.

At this time there appeared to be very little in the way of treatment, necessary or admissible. I attempted to restore the thyroid cartilage to its natural position and form, but with only very partial success.

A bandage was applied pretty firmly around the neck with the effect of facilitating respiration to some extent, and enemata were ordered, first laxative and afterwards nutritive. At an early hour, on the morning of the 16th, I left him with instructions to keep me informed as to his progress.

On the 17th a very unfavourable report was received, in consequence of which I revisited him early on the 18th, provided with a conveyance suitable for transporting him to Kingston. On this occasion I found him very much changed for the worse, respiration laboured and painful, pulse small and irregular, countenance intensely anxious and haggard; he had not slept since the accident occurred, nor had he attempted to swallow anything since my previous visit; his whole body was bathed in a cold clammy sweat, and altogether he appeared to be in immediate danger of sinking. On making the attempt he found that deglutition could now be performed with comparative ease and comfort, consequently a mixture of brandy and milk was freely administered with the effect of very rapidly improving his condition.

On 19th and 20th patient complained a good deal of sleeplessness, in fact he had hardly slept at all since the accident occurred; otherwise everything seemed to be going on well.

On night of 20th he became restless and anxious, complained of difficulty of breathing and pain in the neighbourhood of the larynx. He walked about the room nearly the whole of the night, and at daylight on Wednesday morning became suddenly much alarmed by the rapidly increasing dyspnœa, and what he described himself as "a sinking feeling." At this time he stated to me his conviction that he had not many hours to live—a conviction which I found it impossible altogether to remove.

At ten A. M., Dr. Dickson saw the case with me, and several unsuccessful efforts were made to obtain a view of the rima glottidis; the most cautious manipulation inducing violent reflex action.

The power of deglutition, though impaired, was not altogether lost, and fluid food and stimulants were freely administered.

At 8 P. M., the dyspnœa had become very distressing, and it was evident that unless relief could be afforded in some way, very soon the man would die asphyxiated.

Dr. Dickson now revisited the case with me, and at last succeeded in obtaining a satisfactory view of the fauces and upper part of the windpipe, when it was seen that the glottis was all but occluded by œdema.

The course was now quite clear, and I proceeded at once to perform the operation of tracheotomy. It would indeed be difficult to imagine a more unfavourable case for the operation. Between emphysema and exudation, the trachea was very deep, the veins of the neck were of course distended to their utmost capacity, and the patient was struggling violently for air.

Having cut into the trachea and introduced the largest size tracheotomy tube, we were disappointed to find that no air passed into the lungs, from which it was feared that an insurmountable object existed lower down.

The case now appeared desperate, and the man was on the point of dying asphyxiated, when I seized a silver male catheter and at once passed it into the trachea and beyond the obstruction with the immediate effect of affording the patient an adequate supply of air.

I subsequently prolonged the incisions downwards, and introduced the tracheotomy tube, which now worked quite satisfactorily.

The tube having been tied in the usual way, and the patient comfortably propped up in the large arm chair in which the operation was performed, he fell into a sound and natural sleep for more than seven hours; this was the first good sleep he had had since the receipt of the injury.

Up to this time indeed he had never been asleep for more than five minutes at one time, and very seldom even for this short period.

On the morning of the 21st he felt, comparatively speaking, very well. Respiration was performed with perfect ease, the fear of impending dissolution no longer oppressed him, and he was able to partake freely of food and stimulants. Nevertheless, there was an evident tendency towards sinking, the pulse did not respond to the stimulants which were administered with the utmost liberality. He slept a great deal, and was frequently suffused with a cold sweat.

This critical condition lasted for two days, after which he gradually recovered his strength. The emphysema disappeared and the neck and face resumed their normal appearance. On Saturday, June 29th, I removed the tube, and stitched up the wound with metallic sutures. Since then the patient has been working in his harvest field, and when last seen (a week ago) was in perfect health.

Fracture of the cartilages of the larynx is extremely rare, still a few well authenticated cases have been recorded by MM. Sodoly, Oliver, Margolin, Plenck, Morgagni, Remer, and Dr. Frank H. Hamilton of New York.

In all these cases the effects of the injury were either so slight as to require no surgical interference or else so serious as to be fatal.

Dr. Hamilton's case is, so far as I am aware, the only one in which tracheotomy was performed; in this and in several other respects, the most striking resemblance will be observed between that case and the one I have just described.

The principal difference between the two cases consists in the fact that Dr. Hamilton's case died of exhaustion seventy-two hours after this accident, and thirty-four after the operation.[1]

OPHTHALMOLOGY.

34. *Strumous Ophthalmia, with Reflex Contraction of the Orbicularis Palpebrarum.*—The *Lancet* (Nov. 4, 1865) contains a paper on this subject by Mr. Athol A. Johnson, the principal points in which are as follows:—

1. One form of strumous ophthalmia is characterized by *inability* to open the eye, in consequence of *involuntary* contraction of the orbicularis palpebrarum.

2. This reflex contraction is in relation with hyperæsthesia of the retina or first nerve *alone*, or (more generally) of the ophthalmic branches of the fifth likewise.

3. The hyperæsthesia of the conjunctival, lachrymal, and nasal branches induces the reflex acts of closure of the eyelids, lachrymation, and sneezing.

4. The hyperæsthesia is occasionally uncomplicated; but in most cases, it is soon followed by low inflammation of the conjunctiva, cornea, &c., dependent possibly on the impaired nutrition of the membrane from the altered nervous action, as well as from the mechanical irritation of the parts.

5. For the relief of this hyperæsthesia and spasmodic contraction of the lids, such medicines as belladonna, hyoscyamus, conium, or stramonium, which allay nervous sensibility and relieve spasm of the sphincters, would seem to be indicated; and of these, belladonna certainly has been found to be practically useful.

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35. *Blennorrhagic Conjunctivitis treated by Alcohol.*—A man aged 22, suffering from purulent gonorrhœal conjunctivitis in the left eye, was admitted into La Pitié under M. Gosselin. The eye had been affected five days. On admission, the eyelids were swollen, red, and glossy; their edges were agglutinated by thick yellowish pus. There was intense photophobia. The palpebral conjunctiva was red and thick, and its lower *cul-de-sac* contained a large amount of pus. The conjunctiva of the eye was much injected, forming a considerable chemosis around the cornea, and presenting on its surface purulent deposits. The cornea was healthy, transparent, and neither ulcerated nor opaque; the anterior chamber and iris were healthy, and the pupil regular and movable. The

[1] Hamilton on Fractures and Dislocations, page 135.

patient complained of severe pain around the orbit. The right eye was healthy. The patient had had gonorrhœa nearly a month, when the eye became inflamed; but he could not tell how or when it had become inoculated. The next day, the treatment was commenced by injecting every two hours a mixture of one-third of spirit in two-thirds of water; the eyelids being held apart, the injection was applied by means of a small glass syringe. The first application produced severe pain, which lasted about ten minutes. In the intervals between the injections, cold water dressing was applied. Three days afterwards, the condition of the eye was much improved; and the patient was ordered to keep applied to the eye a mixture—one-third as strong as that already described, and to have the injection used three times a day only. Ten days after the commencement of the treatment, the cure was complete. Notwithstanding every precaution, the conjunctiva of the right eye showed some injection and redness, but this soon ceased on the application of compresses dipped in a mixture of one part of spirit and three parts of water.—*Brit. Med. Journ.*, Sept. 16, from *Bull. Gén. de Ther.*, May 30, 1865.

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36. *Sympathetic Ophthalmia.* By MM. GUÉPIN and WECKER.—M. Guépin, of Nantes, believes that reflex ophthalmia would be a preferable appellation for this affection. He states that in the early period of his career he treated it by mercurial frictions, belladonna, and bleeding, and that many of his patients became blind, although he found the advantage in several cases of traumatic ophthalmia of extracting the cataract and liberating the iris from tension as a means of relieving the temporal and supra-orbital pains which so often precede the internal fluxion. Since 1838, however, he has acquired the conviction that sympathetic ophthalmia is almost always a sign of debility, and that bloodletting does not constitute the best antiphlogistic; and he now finds himself, by the employment of ammoniacal vesicants, cupping at the nape, and the use of mercurials, joined to a careful watching of the progress of the case, always able to prevent the development of the affection. During the twenty-six years in question he has, it is true, frequently practised the ablation of the anterior portion of the eye, extracted cataract even during the acute stage of the inflammation, and performed iridectomy, in-order to assuage pain in an organ whose functions were lost or nearly lost; but he avers that he has never so acted under the idea of preventing the supervention of sympathetic ophthalmia, as he has always found this readily yield to the treatment indicated.

We have thought it right to place on record the results of the observation of so experienced a practitioner as M. Guépin, but the practice of M. Wecker will be found more in harmony with that which prevails amongst ourselves. He recently delivered a clinical lecture for the express purpose of impressing upon his auditors the necessity of performing the speedy enucleation of the eye, as the only preservative from sympathetic ophthalmia to be relied upon. In some exceptional cases this remedy may prove of efficacy even after the inflammation has commenced; and he relates an interesting example of this, in which the mischief was arrested with remarkable rapidity. The sympathetic ophthalmia manifested itself under the form of serous iritis in the right eye of a man fifty-nine years of age, whose left eye, struck with a fragment of steel three years since, rapidly atrophied, retaining much morbid sensibility, which was capable of being roused by pressure even at so remote a period. The only effect of a partial ablation of the eye, performed three and a half months after the accident, was the production of prolonged and painful suppurative inflammation in the remaining portion of the organ. On the patient's admission, the pupil was neither irregular nor encumbered with plastic deposits. There were slight diminution of colour and contractility of the iris, some injection of the perikeratic vessels, moderate ciliary pains, and amblyopia somewhat more considerable in proportion to the intensity of the other symptoms. These symptoms were in themselves of little consequence, but considered in connection with the history of the case, and the efficacy of the rational means of treatment which had been adopted, they indicated a condition of such gravity that enucleation was at once performed. The success which followed was remarkable, for the disease, which had remained stationary during several weeks, now rapidly yielded to ordinary

remedies. But all this case teaches is, that under such circumstances we should not absolutely despair, as we may exceptionally succeed, even after inflammation has been set up; but the true manner of regarding enucleation is to view it as a prophylactic, the opportunity for employing which has already passed away when the earliest morbid phenomena have appeared. "Enucleation, in fact, becomes urgent in any case in which an eye injured by a foreign body that induces inflammation and destroys all perception of light, remains after the loss of its functions hard to the touch and spontaneously painful—almost certain signs that the vulnerant body remains within the injured organ. Moreover, it should be practised whenever an eye, whether injured or not, lost to vision, becomes a source of annoyance to its owner by remaining the seat of continuous or intermitting pains of a certain intensity. Not only may we in this way prevent sympathetic ophthalmia, which may take its point of departure from these pains, but we restore to the patient a peace and repose of which he has been sometimes deprived for several years." As to the partial ablation of the organ, which has been recommended as a substitute for enucleation, as affording more facility for the adaptation of an artificial eye, not only is its prophylactic efficacy unestablished, but it too often gives rise to very painful suppurative inflammation. Even after enucleation, too, the divided muscles, retracted though they be, will usually impart a considerable amount of movement. "To sum up: this is the sole method which indubitably secures the patient from sympathetic ophthalmia, and of all the operations which have been proposed to this end it is the most certain, the most easy, and the least dangerous in its consequences. To convey an idea of the importance which I attach to conservative enucleation executed in opportune time, I may be allowed to say that I should prefer performing it ten times without absolute necessity, to neglecting it once in a case of misunderstood urgency."—*Brit. and For. Med.-Chir. Rev.*, Oct., from *Annales d'Oculistique*, May, 1865.

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37. *Retinal Disease occurring in the Course of Kidney Disease.*—In the No. of the *Med. Times & Gaz.* for Nov. 18, 1865, there are reported a number of cases, from several sources, showing the connection of certain changes in the retina with Bright's disease.

Mr. HULKE gives, in the same journal for Jan. 2, 1864, the following account of these changes:—

"The structural alterations which give rise to these morbid appearances have been ably worked out by German investigators, with whom the retinal disease appears to be more common than with us. Summed up briefly, the grayish opacity of the nerve-disk and retina proceeds from serous infiltration, from sclerosis and hypertrophy of the connective tissue, and from a nodular thickening of the nerve fibres, which acquire such dimensions that some have maintained them to be sclerosed ganglion cells. The small, brilliant white dots are groups of large granular oil-corpuscles, situated in the layer of the outer and of the inner granules. Schweigger supposes that they originate in the connective tissue corpuscles. The redness of the optic disk is from capillary congestion, and perhaps also from the presence of new vessels. The apparent interruption of the vein is due to the intervention at those spots of a thicker layer of opaque retinal tissue between them and the observer. The white appearance of the arteries is caused by amyloid changes in their walls, with corresponding diminution of their calibre. The hemorrhages proceed from—*a*, the disturbed vis capillaris resulting from the morbid state of the blood produced by the kidney disease; *b*, an increased mechanical resistance to the free efflux of blood through the veins at the nerve-disk offered by the sclerosed connective tissue; *c*, and in some cases, hypertrophy of the left ventricle, which urges the blood more freely into the retina than it is able to escape from it. These are the morbid changes which cause the loss of sight. The sudden obscurations (distinguished from accidentally discovered pre-existing dimness) depend on hemorrhages, and their recession coincides with the removal of the extravasated blood. Some cases are susceptible of considerable improvement by treatment. That which I often follow consists in putting a leech to the temple once a week, and the internal

exhibition of the tinct. ferri muriatis. Corrosive sublimate, so useful in some forms of retinitis, has not appeared to me to be serviceable here."

Mr. ERNEST HART, in calling attention to a case of advanced albuminuric retinitis at St. Mary's Hospital, remarked that it was of particular interest to ascertain how far the disturbances of vision, associated with nephritic albuminuria, were pathognomonic, and what extent the ophthalmoscopic examination of the eye, in patients so affected, could assist the diagnosis or aid the treatment. Ophthalmic surgeons occasionally meet with cases of acute retinitis albuminurica in which the affection of the sight is the first striking symptom, and in which the ophthalmoscope anticipates the diagnosis of the physician, derived from the clinical history and the chemical analysis of the urine. Such cases, however, were, in his experience, rare, and usually were examples of oversight due to various causes, such as eccentricity of the complaint or of the patient, and unusual complications diverting the attention of the physician. In the case in question the patient had come to a practitioner complaining of acute pains in the ankles—"rheumatic pains," as he himself called them. That diagnosis had seemed to be borne out by various collateral circumstances, and had passed muster; meanwhile, however, and rapidly, the sight had become very much disturbed, and, as the man's livelihood depended upon his keen perception of minute textile difference of structure, he was quick to perceive and to suffer from this deterioration of the acuteness of his vision. When examined by Mr. Hart, the ophthalmoscope immediately revealed, in the right eye, the most marked and considerable retinal changes, perfectly diagnostic of albuminuric retinitis, obscurity of the papilla, bright fatty patches of the retina, with a tendency to grouping around the yellow spot, and irregular extravasations of blood affecting the linear arrangement. The diagnosis was permissively positive, for the changes accompanying albuminuric retinitis once seen cannot be mistaken. The vision of the eye was considerably affected, much more so than the patient had been aware till the eyes were tested separately. Only No. IV. Giraud Teulon's type could be read at the ordinary reading distance. The examination of the urine showed a large amount of albumen. Treatment by muriated tincture of steel with a free use of the Turkish bath failed to relieve the patient, and he died at the end of three months, all but blind with the right eye, and having very imperfect vision with the left. The pathological changes were of a typical character, the ecchymoses becoming more numerous, the fatty patches coalescing, and the macula lutea being almost entirely destroyed; the retina was not detached. Mr. Hart expressed the opinion that the ophthalmoscopic observation of these symptoms was interesting, as affording a means of studying the changes which the nervous, like the other tissues, undergo in this blood disease, but they afford no indications for local treatment, which, indeed, in such a condition, would be out of place. To what extent could repair go on after serious destruction of the retinal nerve tissue? An examination of a series of cases of albuminuric retinitis might afford the answer. He had not had the opportunity of witnessing any case in which good result had attended treatment, but probably others might have done so. He knew of no record, but would hesitate to believe that nephritis with albuminuric retinitis was always fatal. This was a point to be decided by the accumulation of evidence.

There were, however, other and more trifling affections of the sight in nephritic albuminuria which came under the notice of the ophthalmic surgeon, in which the ophthalmoscope revealed nothing, but to which attention should be directed, because he believed that, as they were of earlier occurrence so they were of greater value in directing treatment. There is a form of intermittent dimness of vision unaccompanied by ophthalmoscopic change which had frequently come before him, and in which, guided by the observations of Landouzy, he had always looked for albuminuria in the urine, and several times he had found it. It was unassociated with any apparent change in the retina, and was probably due to the cerebral disorder either precedent to or consequent upon albuminuria. M. Landouzy, who approached the question from the simple study of the naked eye symptoms, had drawn the following conclusions from his study: 1. That the disturbance of vision is an almost constant symptom in albuminous nephritis. 2. That these troubles constitute a new species of amaurosis, which may

be called albuminuric. 3. That the albuminuric amaurosis cannot be attributed to the deterioration of the strength. 4. That it very often announces the disease as an initial sign, before the invasion of the pathognomonic accidents. 5. That it appears and disappears, and then returns without exactly following the phases of the albuminous deposit in the urine or of the œdema. 6. That it should lead us to consider albuminous nephritis as an alteration of the ganglionic system.

Mr. Hart remarks that Dr. Roberts, in his recent work, attributes the "hemorrhagic blindness" of retinitis albuminurica, which he speaks of as in no sense uræmic to the hypertrophy of the left ventricle, which so commonly accompanies a contracting kidney and the increased tension in the arterial system consequent thereto. But that this explanation, while it assists to understand the frequency of the extravasation from rupture of small retinal vessels, would be incomplete unless we recalled also to the mind the considerable fatty degeneration of the retinal connective tissue and the sclerosis of the nerve-fibres. The deposit of fat was frequently locally anterior to the appearance of ecchymoses. The value of ophthalmoscopic examination in all cases, whether of amblyopia or retinitis albuminurica, was thus apparent, both in reference to the negative information which it afforded in the one case, and the positive data supplied in the other. Intermittent amaurosis associated with albuminuria pointed, he said, to a train of causes very different to those connected with the incomplete but persistent blindness due to fatty substitution and inflammatory destruction of the nerve fibres of the retina. It was to be observed how much more complete the loss of vision was for the time where, as in the amblyopic state noted, the cause was central, than where, as in the true albuminuric retinitis, the loss of vision was due to peripheral disorganization. A considerable amount of retinal disease was compatible with the retention of considerable power of sight; and thus, as in other forms of disorganization of the retina, especially pigmentary retinitis, the patient did not discover the serious affection of the eyes until the disease had extended very far. Hence, if the use of the ophthalmoscope were deferred until urgent symptoms appeared, the examination was apt to be put off till the changes of doing good were materially diminished. It was the more important to remember this because it was precisely in the case of peripheral disease that the ophthalmoscope afforded the most extended and most useful information, and enabled the surgeon or physician carefully to intervene, if in time and in suitable cases.

Mr. Hutchinson, in some clinical remarks at the Royal London Ophthalmic Hospital on cases of disease of the retina from Bright's disease, mentioned that he had repeatedly diagnosed the existence of the latter from observation of the state of the eye. It was not, he observed, in the cases of Bright's disease, attended by dropsy, and, therefore, furnishing their own clue at a glance, that retinal changes were most often met with. It was rather in a group of insidious cases, in which patients become dyspeptic, suffer from general malaise, and lose colour without showing more definite symptoms, that retinal deposits are met with. He related some instructive facts illustrating this, and proving also how important a good knowledge of the ophthalmoscope is to the general physician. In one, a gentleman from Liverpool had been for a long time under medical treatment on account of dyspepsia, and at length found his sight failing. For the latter symptom he came up to town, and on using the ophthalmoscope the conditions characteristic of Bright's disease were at once found, and on examination of his urine, albumen was detected. In a second instance, a lady from New Cross was sent to Mr. Hutchinson by her medical attendant with the history that for a year past she had suffered from great irritability of stomach and was now losing her sight. Her retinæ showed apoplexies and albuminoid deposits, and this led to examination of the urine with the result anticipated. In neither of these two cases had the patients ever suffered from dropsy or œdema of the feet. A third case was yet more interesting since the discovery of retinal disease was made under very unusual circumstances. Last winter a man was admitted into the London Hospital having been found insensible in a woodyard. He was a workman in the yard, and was believed to have fallen from a stack of wood, but no one had seen him fall. His head was bruised, but

no serious injuries could be detected; as he was quite insensible, no history could be obtained from himself. The pupils were dilated. On using the ophthalmoscope, Mr. Hutchinson found, to his surprise, the usual evidences of Bright's disease in both retinæ. There were patches and dots of deposit and large extravasations. This discovery led to the suggestion that the man was suffering from apoplexy, and not from injury. He died during the following night, and the autopsy proved the correctness of the diagnosis. Both retinæ were extensively diseased; the urine contained in the bladder was loaded with albumen, and the kidneys were contracted and granular; the lateral ventricles of the brain were crammed with blood-clot. The man had not suffered from dropsy, and had kept at his work throughout.

38. *Graves' Disease.*—The following interesting clinical remarks were made by Dr. REITH on the occasion of a case of Graves' disease admitted into Aberdeen Royal Infirmary, and in which an opportunity was afforded for a post-mortem examination.

The singular triple combination of symptoms constituting Graves' disease is by no means an uncommon occurrence. Interesting as it is to the physiologist as well as to the pathologist, its nature has given rise to much discussion, inasmuch as the post-mortem examinations of patients affected with it have not tended to unveil the obscurity which surrounds it. When we reflect that the essential feature of the disease is the existence in the same individual of a triad of symptoms apparently unconnected with each other—namely, palpitation, enlargement of the thyroid gland, and protrusion of the eyes, we cannot be surprised at the great difference of opinion which prevails regarding its pathology. The difficulty is not diminished by the circumstance that, in some cases, one of the above symptoms is wanting, and that the affection occurs in stout as well as in anæmic persons. But whatever may be the primary cause, it is evident that those theories which refer the symptoms to anæmia and chlorosis, to pressure on the veins by the enlarged thyroid gland, or to venereal excess and disordered sexual function, are untenable, on the following grounds:—

1. Many of the patients are neither anæmic nor chlorotic; on the contrary, some are well-coloured, and even plethoric.

2. In not a few instances, especially in men, the thyroid gland is but slightly enlarged.

3. One of the three most prominent symptoms is often absent, or but slightly manifested. Thus there may be palpitation and goitre without proptosis, palpitation and proptosis without goitre, goitre and proptosis without palpitation.

4. The symptoms succeed each other in different orders in different individuals.

5. Patients affected with debilitating discharges are not subject to this disease.

6. The cardiac murmur at the base of the heart, when present, differs from that of anæmia.

7. Considering the rarity of the disease compared with the number of persons addicted to venereal excess, we can scarcely regard such excess as having any connection with it. There is, however, an undoubted relation between it and disturbance of the female sexual functions.

The opinion, first promulgated, I believe, by Trousseau, and now shared by Begbie, Fletcher, Laycock, etc., that the true cause of the disease is a neurosis of the cervical sympathetic nerve—is the one most consistent with our present physiological knowledge. The striking resemblance between the effects of artificial lesion of the sympathetic and the symptoms of Graves' disease fully justifies the inquiry as to the probability of a morbid lesion of the same nerve being the *fons et origo mali*. The connection of the sympathetic with the heart and the thyroid gland may be considered as satisfactorily demonstrated; and as excitement of the female sexual organs influences by reflex action through the ganglionic system, both the heart and the thyroid gland, there is ample reason for assuming that a lesion of that system itself would operate directly upon the organs connected with it. I am not aware that any post-mortem examination has yet thrown light upon the condition of the sympathetic in Graves' disease, and, consequently, Trousseau's opinion, however probable, requires confirmation. The case just recorded will therefore be of interest.

The case, it will be seen, differs somewhat from the usual appearance of Graves' disease. Instead of both eyes protruding at one time, there is an interval of a good many years between the protrusion of one eye and that of the other. Again, there is no history of palpitation. It should be remembered, however, that, when the patient was seen, his memory seemed entirely confused, and evidently could not be trusted, although, he was otherwise perfectly conscious of his condition. But whether palpitation existed or not, there can be no doubt that the case belongs to the same category as Graves' disease. There are some slight modifications, and its true place would probably be among the cases called "*fruste*" by the French. At the autopsy the various organs were found exactly as they have been found in Graves' disease—in a state of passive congestion. After a most careful dissection, nothing was found which would account for death except venous congestion of the viscera, and for this there was no apparent cause, unless we recognize as morbid the condition of the sympathetic. On the left side the trunk of the nerve and its two upper ganglia were considerably enlarged, while the inferior ganglion was not only enlarged, but hardened, so as to feel like cartilage. On the right side the nerve preserved its original appearance, but its inferior ganglion was in a similar condition to that of the left side. In addition the cellular tissue surrounding each inferior ganglion was thickened and hardened. Here, then, were alterations perceptible even to the unaided senses, sufficient, I believe, to account for the symptoms observed during life. For if we admit, with most physiologists, that the simple division of the cervical sympathetic is followed by a peculiar train of effects referable to the eye and the bloodvessels of the head, we must infer, also, that a morbid action in the same nerve will be followed by a corresponding train of symptoms. And this is what was observed in the present case. The trunk of the left nerve was enlarged, and the inferior ganglia of both sides presented such alterations that the whole substance of the nerve must have been implicated; and we can hardly suppose such to take place without serious interruption to its functions. The question then arises, What was the nature of this alteration? The microscopical appearances were far from decided, the only thing noteworthy being condensation of the ganglion cells, with an immense quantity of granular matter. It is thus very difficult to form a positive opinion. I have no doubt that the enlargement of the trunk and two upper ganglia on the left side was due to hyperæmia; but how it was induced is not at first sight clear. There was evident structural change in the inferior ganglia; but this had no special characters. Notwithstanding the apparent obscurity, I think we have sufficient data for a satisfactory, though I admit not conclusive, explanation. It is well known that syphilitic deposit may take place in the nerves and other tissues of the body of an albumino-fibroid description. This deposit, however, is not to be distinguished by its character from an ordinary inflammatory exudation, and the inference of syphilis can be drawn only from the presence of similar deposits in large quantities in other organs, the previous history, etc. In like manner a tuberculous deposit may occur, not distinguishable from an inflammatory exudation, and only assumed to be tubercular from the existence of undoubted tubercle elsewhere. This is what I believe took place in the above case. The ganglia were altered in structure, and the alteration presented no special character. When we consider, however, that there was extensive tubercular infiltration in the cellular tissue of the neck, that there was enlargement of the cervical glands, and that the neck from ear to ear was covered with scrofulous cicatrices, the assumption is warranted that the ganglia of the sympathetic were involved in a similar manner. There is no reason why the sympathetic nerve should not be subject to the same morbid lesions as other organs, producing effects proportional to the important part it plays in the economy, and I think that the explanation of the present case just given is, at least, fairly admissible. The nerves appear to have been involved by contact with the surrounding infiltrated tissue. This induced hyperæmia and then hypertrophy of the trunk above on the left side, and hyperæmia alone of the trunk on the right side, where the morbid action was evidently recent. The hypothesis just started receives confirmation from the condition of the sympathetic nerve and ganglia in various diseases. Rokitansky says, "There might, however, be a true hypertrophy of

the ganglia, in aggregating of new ganglion cells; although of it also we lack proof from facts. I have met with a case of general emaciation combined with an eminent degree of hypochondriasis, in which the central abdominal ganglia were considerably enlarged." And again, "More important instances of hyperæmia are found in the sympathetic system; its central ganglia became congested in the course of general acute processes of low type (dyscrasisch), which become localized in those structures to which the ganglionic nerves are distributed, especially in the mucous membrane and follicular apparatus of the intestines. The congestions of the ganglia just mentioned in the early stages of ileo-typhus (typhoid), in the course of cholera and cholera-typhus are of this class." The same writer further states that exudations are not uncommon in nerves, these exudations involving the surrounding cellular tissue. The anatomical condition of the lower cervical ganglia and left sympathetic in this case, is quite analogous to Rokitansky's description, and may be set down to a low exudation, probably tubercular. This would lead us back to the blood as the ultimate cause of the disease, but it is probable that in all disorders depending on a constitutional diathesis, the blood and the vaso-motor system have a mutual action and reaction on each other, and that whether the one or the other be the primary seat of the morbid change, both come to be simultaneously affected. Begbie holds this view, but thinks that the *primum mobile* is the blood, at least in Graves' disease.

There is an apparent discrepancy in this case between the physiological and pathological results of lesion of the sympathetic. Section of the nerve causes falling in of the eye, contraction of the pupil, and dilatation of the bloodvessels; irritation of the nerve produces the opposite effects, protrusion of the eye, dilatation of the pupil, and contraction of the bloodvessels. In this patient there were two of the symptoms of irritation, proptosis and dilated pupil, with one of the symptoms of paralysis, dilatation of the bloodvessels. Belladonna exercises a similar action, causing dilated pupils (irritation), and enlargement of the bloodvessels (paralysis), although it is maintained that in the first instance the bloodvessels are contracted. Two explanations may be given of this anomaly. In the first place, the primary contraction of the bloodvessels caused by irritation of the nerve, as in the first action of belladonna, had been followed, according to the laws of stimuli, by an excessive reaction. Again, Brown-Séquard concludes, from observations made by himself, Bernard, and others, that there are two kinds of influence exerted by the sympathetic and the nervous system generally. By the one, when the sympathetic is excited the bloodvessels contract, and by the other they enlarge in consequence of a greater attraction for arterial blood developed in the tissues. Which of these two explanations is correct it is impossible at present to say. Claude Bernard endeavours to make out that there are two sets of fibres sent out from the oculo-spinal tract of the cord, one set, which he denominates oculo-pupillary, affecting the eye and the pupil, and the other, vascular calorific, specially affecting the bloodvessels, and that either set may be affected independently of the other. Reflex actions on the vaso-motor nerves cause a momentary contraction of the bloodvessels, which is followed by their dilatation. If these views be correct they may assist in throwing light on the subject, but it is evident that the cause of enlargement of the bloodvessels and consequent congestion is still obscure.

Various opinions have been entertained regarding the cause of the exophthalmos, but most writers consider it entirely the result of venous congestion and post-ocular serous effusion. This was the actual state of the right orbit in this case. But there was no such effusion, and much less congestion existed in the neighbourhood of the left eye, which was more prominent than the right. Supposing that the right eye had originally been protruded in consequence of congestion and serous effusion, it seems to me that, after the lapse of so many years, the eye would have recovered its original position in the absence of any mechanical perpetuating cause, as tumour, etc. Now, exophthalmos is often not present, or, if it is, not nearly to the same extent as here, in cases of extreme venous congestion, as in strangulation. While, therefore, congestion may assist in the production of exophthalmos, nervous influence must play a considerable part in the action, but how, has been hitherto unexplained.

Since the above was written I have seen an account of a discussion on Graves' disease in the *Société de Médecine* of Paris, recorded in the *Gazette des Hôpitaux* of March 21 and April 16, 1865. A case is mentioned where the sympathetic nerve was carefully examined. The lower cervical ganglia, especially on the right side, were much enlarged and reddened. Under the microscope the ganglionic structure was found almost obliterated, what remained of it being inclosed in the meshes of hypertrophied connective tissue, which composed the greater part of the ganglia. Predominance of the connective element and diminution of the nervous element constituted the alteration. For a full report of the case and the discussion I refer to the journal above mentioned.—*Med. Times & Gaz.*, Nov. 11, 1865.

39. *Black Cataract.*—Mr. Nunneley, of Leeds, showed to the Pathological Society (Nov. 21, 1865) a specimen of this. The patient, 75 years of age had had double catract. Nothing unusual had been observed in the case. The right lens, which had been the longer affected, was extracted January 19, 1865. It was then quite black at the centre, and nearly so at the margin, but it had become of a lighter colour by keeping. The other lens was extracted in February, and was of a lighter colour, and also was of a lower specific gravity.—*Med. Times and Gaz.*, Dec. 2, 1865.

MIDWIFERY.

40. *Mortality of the Childbed as affected by the Number of the Labour.*—The *Edinburgh Medical Journal* for September last contains an interesting paper on this subject by Dr. J. Matthews Duncan. The author, after presenting the statistics he has collected, remarks, "It must be noted that I have, hitherto, at least, said nothing regarding the nature of the relation between the number of the delivery and the mortality attending it. It is true the data recorded demonstrate more or less completely certain coincidences, which may be called laws. But they establish nothing further. These laws are as follows:—

"1. The mortality of first labours is about twice the mortality of all subsequent labours taken together.

"2. The mortality from puerperal fever following first labours is about twice the mortality from puerperal fever following all subsequent labours taken together.

"3. As the number of a woman's labour increases above nine, the risk of death following labour increases with the number.

"4. As the number of a woman's labour increases above nine, the risk of death from puerperal fever following labour increases with the number.

"5. If a woman has a large family, she escapes extraordinary risk in surviving her first labour, to come again into extraordinary and increasing risk as she bears her ninth and subsequent children.

"These laws, although they merely state coincidences, have very important practical bearings, which are too self-evident to require description. They have also important philosophical bearings, which were alluded to in the commencement of this article. The most important, perhaps, of these relate to puerperal fever. These also I shall not enter upon farther than to say, that the attendance of puerperal fever specially on primiparæ, and women who have born large families—its pretty close correspondence in relative amount to the general mortality of parturition after different pregnancies—its subjection also to the law of the duration of labour—do not appear to me no lend support to the views hitherto generally entertained regarding it, and expressed in the words accidental fever, contagious, epidemic. Another point under this head I shall merely mention. Authors, comparing the mortalities of lying-in institutions, whether from puerperal fever or from other causes, are frequently found neglect-

ing to begin by ascertaining whether or not they are fit objects of comparison, and under this head, *inter alia*, neglecting to ascertain the comparative amount of primiparity in each institution. It is plain that, unless there be nearly the same comparative amount of primiparity in the institutions, their respective gross mortalities cannot be justly compared with one another."

41. *Fatal Case of Accidental Hemorrhage.*—Dr. YOUNG read the following case of this to the Obstetrical Society of Edinburgh (26 April, 1865), which we lay before our readers, with a report of the interesting and instructive discussion to which it gave rise:—

"Mrs. A., æt. 40 or 41, was rather of a corpulent habit, and had long enjoyed excellent health. I was called to visit her at 6 A. M. on the 22d February, when I found that about a pint of blood had escaped in the chamber utensil, and a considerable quantity in the bed. On examination, I had some difficulty in even discovering the os uteri, and found some exertion necessary in the introduction of one finger, it being almost of cartilaginous firmness, and so far from the cervix being thin, the length of this callous canal could not be less than one inch. She has felt no pains. She was only in the eighth month of pregnancy, or rather had not completed the eighth month.

"After remaining with her for about an hour, I ruptured the membranes with a blunt-pointed probe, about nine inches long, and encased in a small-sized male catheter made straight, having the farther end open, which I had formerly employed for the purpose of inducing premature labour till a safer and better method was introduced. I had previously tried to rupture the membranes in the present case with a pointed piece of whalebone, but found that the membranes yielded before it, as they not unfrequently do when firm and not distended by pain. No good resulted from the rupture; and finding the hemorrhage continuing, and the os uteri as rigid and undilatable as at first, I introduced into the os a sponge-tent, but which, after remaining a considerable time, produced no effect in dilating it. Finding the hemorrhage rather increasing than otherwise, and the utter hopelessness of dilating the os, and the patient's strength giving way, I considered it necessary to have the advice and assistance of Professor Simpson, but who being unable from indisposition to leave his own house, kindly sent Dr. Alexander Simpson. After mature consideration of the whole circumstances, and after making a farther trial of larger sponge-tents, he agreed with me in thinking that the only chance of life for the patient was to make two lateral incisions through the os and cervix of the uterus; this was done about 10 A. M., after which I had little difficulty in gradually, and as gently as possible, dilating the os and introducing the hand, and effecting delivery by turning. There being, however, still too much discharge, we injected iced water into the uterus, which had the effect of greatly modifying the discharge. The pulse being weaker and the patient faint, the supply of wine was continued; and by noon, when we left, she had considerably recovered, but complained of pain, though not severe, in the left iliac region.

"Dr. Simpson saw her again with me at 2 P. M., and found her going on well, the pain not severe, and the pulse 110. She continued to progress favourably till the third day after delivery, when the pulse rose to 120, and the pain had increased, with a slightly tympanic condition of the abdomen. She had already taken a considerable quantity of opium, with small doses of calomel, fomentations, of hot water; poultices with turpentine were also employed. She was ordered nutritious soup, and next day wine. She died on the fifth day.

"*Post-mortem examination thirty hours after death*, conducted by Dr. Jolley, demonstrator of anatomy, who remarks as follows: 'Abdomen very tympanitic. Adipose matter to the depth of an inch and a-half. On opening abdomen intestines found enormously distended with flatus. There was no effusion into peritoneal cavity, and no signs of peritonitis, with the exception of slight injection of the recto-vesical pouch.

"'*Uterus.*—No adhesions. Normal in appearance externally; perfectly free and movable in pelvis; the os and cervix had been laterally incised on the left side to the extent of an inch. The mucous membrane of cervix had a slightly dark sloughy appearance; other organs not examined. The post-mortem examina-

tion revealed no evident cause of death. No inflammation visible in any organ in the abdomen. On one spot of the colon, about the size of a shilling, there appeared a little coagulable lymph. Two fibrous tumours existed in the uterus, evidently of long standing, about the size of a nut, one on the anterior wall of the uterus, and one behind. The incision of the os and cervix, and increase of the aperture by a slight tear, did not extend beyond the junction of the cervix with the upper part of the vagina.'

"Hemorrhage, whether accidental or unavoidable, is always a source of anxiety to the practitioner, and sometimes occasions no small amount of perplexity. It is, to say the least, a grave occurrence. Knowing as we do that unless checked a majority will die undelivered, and I know few more painful positions in which an accoucheur can be placed than when his patient dies undelivered. I have no doubt that one principal cause of fatality is unjustifiable delay, there being often great reluctance to a 'forced' delivery, where the os uteri is in an undilated state, even though soft and yielding, which fortunately is the case in most instances, especially after the first birth. The usual advice in works on midwifery is to wait till the os has assumed a condition favourable for the introduction of the hand. And certainly there is not in general much difficulty in effecting this in cases of severe hemorrhage; but it does occasionally happen that the os, notwithstanding the flooding, and that even in a second or third child, is so firm as to require the continued exertion of the practitioner, especially if the labour is premature. In such cases the probability is, that the undeveloped condition of the cervix is as much to blame as the rigidity of the os.

"Smellie gives three cases where he found it impossible to dilate the os uteri without extensive tearing, and adds, 'by this it appears how difficult it is to dilate this part in women going of a first child, especially when they are pretty old; indeed, it is sometimes impossible to be done before they come to their full time, and even then not till the parts are soft and thin.'

"Plugging the os or vagina, or both, in order to arrest the flooding, is, to say the least, a very doubtful practice. Merriman thinks it inapplicable after the first five months of pregnancy; and for this reason, that the parietes of the uterus, especially after the sixth or seventh month, are so easy of distension as to yield readily to the accumulation within, and thus the blood may collect and increase in the cavity of the uterus till a fatal termination takes place; for, as justly remarked by Ramsbotham—(I cannot help taking this opportunity of saying how much the profession is indebted to Dr. Simpson for the introduction of sponge-tents for the os uteri, so useful and important in many cases, not only of diseases of the uterus, but also of abortions attended with much loss of blood)—'This reasoning is undoubtedly true to its fullest extent in accidental hemorrhage before delivery under retention of the placenta, and in flooding after its expulsion; for, as the blood concretes within that organ, the viscus is more and more distended, its vessels become more dilated, their orifices gape wider and wider, and consequently rendered capable of pouring out a larger quantity of blood in a given time. These remarks,' he adds, 'are not intended to apply to unavoidable hemorrhage; other objections apply to the use of the plug, especially when near the full period of pregnancy.'

"*Rupture of the Membranes.*—Denman, Rigby, Merriman, Blundel, Davis, Conquest, Ingleby, all advocate this practice. Among others, one good result may be, that in consequence of the cavity of the uterus being lessened, the uterine vessels are less likely to continue bleeding, so violently at least. The probability of a farther separation of the placenta to any great extent is lessened, and the partial contraction of the muscular coat of the uterus is likely to diminish the size of the open mouths of the bleeding vessels; besides all this, it is calculated to promote regular labour-pains.

"Dr. Alexander R. Simpson said, that he had shown the placenta in this case at a previous meeting of the society. The members would recollect that there were several points where extravasation had taken place at different times. There was one of a pale colour, another more recent, of a darker hue, and a large one from which the fatal hemorrhage had taken place. The incision of the os, as described above, was the only chance of remedy. There was no unusual discharge from the incision.

"Dr. MOIR remarked that in cases of accidental hemorrhage he never recommended the rupturing of the membranes. The best treatment he considered was to turn the child, and deliver as soon as possible. Many years ago he had a similar case to the present one. There was profuse hemorrhage, and the woman was rapidly sinking. The os was firm, and admitted only one finger, but by tilting up the head and external manipulation he succeeded in laying hold of a foot. The os dilated to the body of the child, and he thus succeeded in saving the patient. Rupture of the membranes he considered useful only where the back of the child was towards the placenta, when it might then act mechanically by pressure on that organ. In other cases it does not stop the hemorrhage, and greatly increases the difficulty of turning the child.

"Dr. BURN remarked that he had had a number of cases of accidental hemorrhage; he invariably ruptured the membranes, and he did not recollect a single case where it did not restrain the hemorrhage.

"Professor SIMPSON stated that in his lectures he recommended rupture of the membranes for accidental hemorrhage. The question was, where does the blood come from? He believed it escaped from the line of junction between the attached and the detached portions of the placenta. By rupturing the membranes, and thus lessening the contents of the uterus, you put this line off the stretch, and thus restrain the bleeding. This mode of procedure often succeeded. Rupture of the membranes, however, no doubt increased the difficulty of turning. He had performed incision of the os two or three times, one case of which he had published, where, by means of it, he had saved both mother and child. Laceration of the os was known frequently to take place during labour, and especially with turning before the os was fully dilated. He had heard of a case lately where tetanus had followed, but this was extremely rare. In cases of unavoidable hemorrhage, he had lately had a new question suggested to him. He had been called to see a lady who had had severe and frequent attacks of hemorrhage during pregnancy, due to placenta prævia. She was now much exhausted from loss of blood; and the question was, whether premature labour should not be induced? There was small probability of saving the child; and should the risk of the patient's life be run by the repetition of these hemorrhages? He had lately found that a practice had got abroad of turning in cases of unavoidable hemorrhage, immediately after the placenta had been removed in the manner recommended by him. This he considered bad practice. It was submitting the patient, exhausted by loss of blood, to the risks of a double operation, and the probability of thus saving the child was very small, while the danger to the mother was great. In some cases, where the presentation was abnormal, it could not be helped; but where the presentation did not necessitate it, he considered it bad practice to interfere further with labour.

"Dr. MOIR remarked that there was a point in reference to post-partum hemorrhage which he had not seen referred to in books. Dr. Hamilton used to state, that when a patient complained after delivery of a constant severe pain in the back, he always found that internal hemorrhage had taken place. In practice, he (Dr. M.) had also always found it the case.

"Dr. BRYCE stated that he had had several patients who flooded in this manner after each delivery, and they always complained of this constant pain, but in his cases it was situated in front. He found it was never safe to leave these patients until the normal recurrent after-pains had come on.

"Dr. PATTISON and Dr. ZIEGLER both related cases where internal hemorrhage had taken place after more than an hour after delivery; both patient's complained of intense pain in the back. It was from this symptom that they had been again summoned to the patients."—*Edinburgh Medical Journal*, October, 1865.

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42. *Rupture of the Uterus; Abdominal Section; Subsequent Pregnancies.*—Dr. S. S. DYER records (*British Medical Journal*, Sept. 9, 1865) a remarkable case of this. The patient was a pauper, 37 years of age, in her fourth pregnancy. The three previous labours had been natural. Mr. Clifton, who first saw the patient, gave the following history: "He had been called this day [July 29, 1862], at six o'clock in the morning, when he found the os uteri about the

size of a shilling. The presentation was natural; the pains trifling and ineffectual. He waited two hours; and, as no progress was being made, he gave a dose of ergot, and continued in attendance another hour. But no increase of pains in force or frequency took place; and he left for his surgery and to see other patients, promising to return; and said that, if wanted before doing so, he was to be sent for. He heard no more of the case until afternoon, and then drove down to Mockbeggar, taking his forceps with him. He was then told that no pains of any consequence had come on till the middle of the day, since which they had been steadily increasing in force and frequency. The os was now fully dilated, and the head at the brim of the pelvis. He went down stairs, determining to give more time for the natural termination of a case which now seemed to be going on favourably, leaving two female neighbours with the patient. In about an hour he was called hastily, and found the woman fainting, blood issuing from the vagina; the head higher than it had been, and rapidly receding. The bystanders said that there had been a violent pain, during which they heard a noise as if something had given way."

When seen by Dr. D. at eight o'clock in the evening the patient was "in a state of great prostration, and evincing signs of severe shock to the nervous system. She was quite sensible; the pulse was quick and fluttering; the breathing short and hurried; the skin cold, and covered with perspiration, which stood in large drops on her face and forehead. On placing the hand on the abdomen, which was very tender, the outline of a fœtus could be distinctly felt lying beneath the parietes; the uterus, contracted to the size of the fœtal head, was evident; and on examination *per vaginam*, it was clear that the uterus was emptied of what it contained."

On consultation it was decided to resort to gastrotomy. In consequence of delay in obtaining instruments and chloroform, the operation was not performed until 4½ hours after the rupture had taken place. The patient recovered most favourably.

On the 9th of Aug. 1863, Dr. D. attended her in a miscarriage and again on the 11th of June, 1864. On the 23d of July, 1865, she was delivered by Dr. D. of a fine living male child, and she made a rapid convalescence.

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43. *Extra-Uterine Fœtation.*—Dr. J. Braxton Hicks read before the Obstetrical Society of London a case of this in which he had detected a fœtus alive in the recto-vaginal pouch of peritoneum. Considering its advance to maturity in that position highly dangerous throughout its development and after, he endeavoured to arrest its growth by powerful galvanic currents. This was repeated without effect. It was then determined to pass a trocar into the fœtus, which was done per vaginam readily without any bleeding. The fœtal movements ceased next day; but vomiting, partly from the chloroform given, continued very violent till about the fifth day, when, sudden collapse supervening, the patient died on the sixth day after the operation. The post-mortem examination showed that hemorrhage was the immediate cause of death, owing to slight separation of the upper part of placental attachment to the exterior of the uterus, but none whatever occurred at the seat of puncture. The examination also showed a curious fact—namely, that the cyst in which the fœtus originally was formed had ruptured, and that the ovum entire had escaped into the recto-vaginal pouch, and continued to live and grow, the ovular membranes filling entirely the pouch, the placenta being attached to the back of the uterus. On opening the original cyst from above, the ovular membranes were seen through the rupture in the cyst. Dr. Hicks having requested the assistance of the President in elucidating these points, and in giving a report, the report was then read, confirming the above facts, and endeavouring to explain the mode of occurrence.—*Med. Times & Gaz.*, Nov. 11, 1865.

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44. *Intra-Uterine Variola.*—M. Legros presented to the Biological Society of Paris a variolous fœtus, with the following history: On May 18th, a woman in the Hôtel Dieu was prematurely delivered of a fœtus aged apparently about five months, which was covered with pustules of smallpox. The mother had distinct marks of vaccination, and had never had smallpox. About six months

previously, she had had connection with a man who was convalescent from variola. No exposure of the mother to contagion could be traced. This case, M. Legros observed, raised the question whether the father could have communicated the smallpox at the moment of fecundation, the disease remaining for five months in a state of latency. This theory he believes to be supported by the facts that, when a pregnant woman has smallpox, the fœtus is sometimes not attacked till some time after the recovery of the mother; and that, in a child of a syphilitic father, the disease in some cases does not show itself in the infant until several days or even weeks after birth.—*Gazette Méd. de Paris*, Aug. 5, 1865.

45. *Retention of Urine in the Fœtus.*—M. DEPAUL related to the Société de Biologie a case in which a woman was delivered of an eight months' child presenting a great enlargement of the abdomen; there was very little amniotic fluid. The child died soon after being born. The bladder was about 4½ inches long and 2¾ wide, and was full of urine. The ureters were also irregularly enlarged, resembling at first sight the intestinal convolutions; and contained urine. The kidneys, especially the left, were also much distended; they were transformed into cysts with thin walls, filled also with urine. The cause of this distension was found to be an imperforate state of the urethra, at the junction of the muscular and prostatic portions. More than a pint of urine was removed. —*Gaz. Méd. de Paris*, July 15, 1865.

HYGIENE.

46. *Ozone.*—Dr. B. W. RICHARDSON, in a paper read before the British Association for the advancement of science at its late meeting, observed that the following are the reliable facts known up to this time respecting ozone. 1. Ozone in a natural state is always present in the air in minute proportions; viz., one part in ten thousand. 2. It is destroyed in large towns, and with special rapidity in crowded, close, and filthy localities. 3. Ozone gives to oxygen properties which enable it to support life. In this respect it acts like heat; its effects are destroyed by great heat. 4. Ozone diffused through air in minute quantities produces, on inhalation, distinct symptoms of acute catarrh. 5. When animals are subjected to ozone in large quantities, the symptoms produced, at a temperature of 75°, are those of inflammation of the throat and mucous membranes generally, and at last congestive bronchitis, which in carnivorous animals are often rapidly fatal. 6. When animals are subjected for a long period to ozone in small proportions, the agent acts differently, according to the animal. The carnivora die, after some hours, from disorganization of the blood separation; but the herbivora will live for weeks, and will suffer from no acute disease. 7. The question whether the presence of ozone in the air can produce actual disease, must be answered cautiously. Science has yet no actual *demonstrative* evidence on the point. But the facts approach to demonstration that catarrh is induced by this agent. All else is as yet speculative. 8. During periods of intense heat of weather, the ozone loses its active power. 9. On dead organic matter undergoing putrefaction, ozone acts rapidly; it entirely deodorizes by breaking up the ammoniacal products of decomposition. At the same time, it hastens the organic destruction. 10. There is an opposite condition of air in which the oxygen is rendered negative in its action, as compared with the air when it is charged with ozone. Air can thus be rendered negative by merely subjecting it, over and over again, to animals for respiration. The purification of such air from carbonic acid and other tangible impurities, does not render it capable of supporting healthy life; but ozone restores the power. In a negative condition of air, the purification of the organic matter is greatly modified, and the offensive products are increased. Wounds become unhealthy,

and heal slowly in such negative air. 11. There is no demonstrative evidence, as yet, that any diseases are actually caused by this negative condition of air; but the inference is fair—that diseases which show a putrefactive tendency are influenced injuriously by a negative condition of the oxygen of the air. It is also probable that during this state decomposing organic poisonous matters become more injurious. 12. As ozone is used up in crowded localities, and as it is essential that ozone should be constantly supplied in order to sustain the removal of decomposing substances and their products, no mere attention to ventilation and other mechanical measures of a sanitary kind can be fully effective, unless the air introduced be made active by ozone. Fever hospitals and other large buildings in towns should be artificially fed with ozonized air.—*Brit. Med. Journ.*, Oct. 7, 1865.

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47. *On the Effects of Scanty and Deficient Food.*—Dr. John Davy, in a paper read at the September meeting of the British Association, commenced by stating that although it is generally believed that health suffers and the constitution is impaired by scanty supply of food, he had good reason to believe that this impression is unnecessarily exaggerated. He had failed to discover to his own satisfaction that an insufficient supply of food created disease, and quoted the experience of many great travellers in Africa, and also of some connected with the Arctic expedition, to show that in great privations and a temporary loss of sustenance, the constitution was not permanently injured in consequence. In fact, Dr. Davy went so far as to say that occasional abstinence from food was likely to prove more beneficial than otherwise. He referred to those tribes of people whose supply of sustenance is precarious, and averred that no particular form of disease was contracted by their not being able to obtain what might be considered a proper quantity of food with regularity. He admitted that such tribes and people are often below the average standard in height and weight, but still maintained that they did not materially suffer in health in consequence of their occasional fasts. The same thing was observable in people of all ages. The persons who had been remarkable for longevity were invariably to be found among the poorer class of people, and were consequently not among those who fared the most sumptuously, or who, even in regard to the quantity, took a large amount of food. Dr. Davy drew attention to the fact that the Irish people suffer more from the scarcity of provisions than we in England, and had been subject to famines almost unknown to us, yet the average longevity in Ireland was greater than in this country. His remarks also applied to animals, and he instanced that cattle which were not overfed were the healthiest, and that the Welsh sheep that obtained their sustenance from the scanty herbage that grows upon the mountains, were not worse than sheep better fed. Dr. Davy referred to that class of people, such as the poor needle-women, among whom the mortality is great, but asserted that this was not owing to the poor supply of food, but rather to bad ventilation, sedentary habits, and other causes. His remarks were, however, principally urged against the present prison dietary system. He stated that our criminals were unnecessarily well fed, owing to the prevalent impression that too little food was dangerous to health, and he endeavoured to prove that a lower scale of diet would not be followed by any dangerous results to the constitution of the criminal. In fact, his remarks went to show that philanthropy in this direction had been carried too far, and by quoting the scale of diet given at various prisons he endeavoured to show that criminals were rather overfed than underfed.—*Med. Times and Gaz.*, Sept. 23, 1865.

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48. *Is the Opinion that a Diet of Animal Food Conduces to Leanness well Founded on Facts?*—In a communication presented to the British Association in September last, Dr. John Davy said those who have advocated the opinion that a diet of animal food conduced to leanness had supported it by arguing that a vegetable diet was commonly richer than flesh in the elements from which adipose matter is formed, such as starch, etc., and further, that carnivorous animals were commonly leaner than herbivorous. He disregarded the first argument, inasmuch as certain kinds of animal food abounded in fatty matter. He instanced the case of animals subsisting on other animals, all of which

were very fat. and he considered that tended to show that a diet of exclusively animal food was in no wise incompatible with fatness. Referring to our own species, it was easy to find corroborative instances. Butchers and their families, who used large quantities of meat, were not remarkable for leanness; and fishermen and their families were generally stout. The English, as a rule, had always been considered large consumers of meat, especially in the olden time, when vegetables were less abundant; and in those periods they were notorious for their stoutness. Did a vegetable diet tend to the production of fat? The Irish, living mostly on potatoes, should be distinguished for lustiness, though they certainly were not; and he had not heard fatness ascribed to vegetarians. Amongst our soldiers and sailors a fat man was a rarity; but that was no wonder, for though their diet contained a large proportion of animal matter, their meat ration was never an excess, and they were rather underfed than overfed; while at the same time they had a great deal of exercise. His opinion, in which he was supported by eminent physiologists, was that a mixed diet, partly animal, partly vegetable, was best adapted to the wants of man, as well as most suitable to his taste; and that the safest way to avoid obesity was to live moderately, observing the happy medium between a too sparing and a too copious dietary; and, for the correction of obesity, attending rather to quantity than quality of food.

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49. *Beef and Pork as Sources of Entozoa.*—Dr. COBBOLD, in a communication read before the British Association at its meeting in September last, referred to the general impression that the common pig was the principal source of entozoa. He asserted that birds and all animals of warm blood were liable to breed parasitic disease, and stated that, in spite of all preconceived notions, the human system was the home of at least two sorts of entozoa. He combated the popular idea that tapeworm was principally derived from measly pork, and asserted that the disease was as often contracted from eating beef and veal. He showed, too, that animals containing parasites did not always display unhealthy symptoms, therefore it was difficult to detect the disease, and asserted that persons who ate moderately of infected meat were liable to be affected with tapeworm. Young animals were less liable to have the disease, and persons eating their food always well cooked were most likely to escape any bad effects. In fact, eating meat always well cooked, and never under-done, was the only sure preventive. Dr. Cobbold, by the aid of diagrams, showed the different kinds of tænia, and stated that the hookless tænia was to be found generally in beef, and the hooked tænia in pork.—*Med. Times & Gaz.*, Sept. 23, 1865.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Report of an Exsection of two and one-half inches of the Right Tibia; Recovery. By W. KEMPSTER, M. D., of Syracuse, N. Y.

Private Alfred Lynn, Co. F, 47th Regt. Pa. Vols., aged 18, German, was wounded at the Battle of Cedar Creek, Va., Oct. 19th, 1864, by a ball which struck the right leg, near the junction of the middle with the lower third posteriorly, and passed directly through, shattering the tibia.

On admission to the hospital (Oct. 23d), he complained of intense pain in his leg, and great weakness; the wound of exit presented a ragged appearance; several large pieces of bone protruded, but they were not detached from the shaft; the fibula was uninjured. He stated that the wound bled profusely at first, and his appearance indicated that he had lost considerable blood; hence it was inferred that the posterior tibial artery had been injured. It was decided that as soon as the patient had gained sufficient strength, or in the event of hemorrhage, the leg should be amputated; in the mean time it was put upon hair pillows, and dressed with oakum, the wounds being occasionally washed with a weak solution of permanganate of potash.

Eight days after admission, the patient having improved in health and spirits, it was decided to amputate the limb; but he strenuously objected, and declared that he would rather die than lose his leg.

Exsection presented the only alternative; he expressed himself willing to undergo any operation short of amputation.

The patient having been brought under the influence of chloroform, an incision four inches long was made, over the spine of the tibia, running through the wound of exit, and down to the bone, which was found extensively comminuted for a distance of two inches; the spiculæ were connected with the upper portion of the shaft; these were detached, and the upper and lower portions of the tibia cut smooth with Liston's forceps; the parts then had the relation to each other of an oblique fracture, with the loss of two and one-half inches of bony structure; the edges of the wound were brought together, and maintained by sutures, and the leg placed in an easy position on pillows. The patient bore the operation well; there was but little hemorrhage.

Nov. 10. Wound looks well, granulations healthy; general health good.

25*th.* A hard tumour can be felt occupying the space made by the exsection, and enveloping both ends of the broken shaft; the wound is discharging laudable pus, and is healing rapidly.

Dec. 11. The tumour, which is evidently callous, is larger, a nodulated border can be felt, corresponding to the spine of the tibia.

30*th.* Upon grasping the upper and lower fragments, and endeavouring to move them, no motion can be felt; the callous retains its size; the patient was allowed to leave his bed to-day for the first time.

From this period the case progressed slowly but favourably; the wound of exit alternately closing and opening; the callous grew gradually smaller, giving the leg a natural appearance; in March, 1865, he could put his foot

to the floor, and bear about fifty pounds upon it; in May, he was able to walk short distances, by favouring it slightly; both wounds had healed.

It was with many misgivings as to the probable result that we performed the operation; and it is our belief that the favourable issue was in great measure due to the *perfect quiet enjoined;* the patient was not allowed to leave his bed for two months; and the foot did not touch the floor under three and one-half months.

Since the above operation was performed we have met with two other cases of the same kind; in one, three inches of the bone were removed; in the other, not quite two inches; both were the result of gunshot wounds, both were in the continuity of the bone, and both recovered with serviceable limbs.

It is to be regretted that this operation has not claimed the attention it deserves. We are fully persuaded of the importance of exsection in the upper extremities, and, should a similar case occur in the course of our practice, it would be treated like the above.

It is a source of disappointment that we had not tried this operation before, believing that some useful limbs might have been saved; but having heard the operation of exsection of the lower extremities denounced *in toto* by our seniors, it is not surprising that we also should entertain similar views, until compelled to relinquish them by force of circumstances.

Case of Paralysis of the Median Nerve. By J. W. MOORMAN, M.D., of Hardinsburg, Kentucky.

I was called on the night of the 15th of September to see a farmer, aged about thirty-eight years. He had been ill for several days with fever of a remittent type, for which a neighbouring practitioner prescribed sulphate of quinia in large doses.

Six hours before I arrived he had, while delirious, fallen from a door some four feet high on a pile of stones. I found him easy except the pain from a few slight wounds of face and neck incurred in falling. Along the whole length of both arms there was a numb dead feeling, or rather want of feeling, and almost total incapacity of motion. Arms cold, pulse at radial artery weak and slow, bowels torpid.

On examination of spinal column, found space over sixth and seventh cervical vertebræ much bruised and very sore. The case I diagnosed to be one of concussion of spine. Ordered calomel and rhei, āā gr. v, to be followed in four hours by a full dose of castor oil and turpentine. Antiphlogistic regimen for several days.

Sept. 20. Patient is up. Still has numbness in his arms, can use them slightly; considerable soreness over cervical region; no febrile symptoms; appetite good, bowels regular. ℞.—Quin. sulph. gr. xl, morphia sulph. gr. iv, strychnia gr. j. M. ft. pil. no. xxx. S. One three times a day. Apply blister, four by six inches, over cervical region.

25*th.* No unnatural feeling in left arm, pain in right arm along the line of the median nerve, complete loss of motion in right thumb. Still some soreness over cervical vertebra. Appetite good; suffering some with diarrhœa. ℞.—Linimentum ℥ij; tr. arnica, tr. nux vomica, āā ℥j. M. ft. liniment., to be rubbed along the line of the pain; continue use of the strychnia; apply second blister higher upon neck.

30*th.* Very little soreness; pain in right arm continues; considerable irritation of bowels; twitching of muscles. Ordered opium and sulphate zinc for the diarrhœa. Discontinue strychnia. Continue liniment.

Oct. 5. Improving; can use arm in ordinary labour; experiences con-

siderable difficulty in moving thumb. Still continues the use of liniment, and thinks he will need nothing more.

In this case, while the injury is apparently confined to origin of the outer cord of the brachial plexus of nerves, the median arising by slips from both cords, is most affected, while the musculo-cutaneous, the continuation of the outer cord, remains intact. Further down the digital branches given off to the thumb are seriously affected, while those given off from the same point to the fingers remain unaffected. There was doubtless inflammation of a chronic character affecting the spinal cord, and as a consequent effusion and thickening of its membranes rendering slight compression inevitable, yet why the whole plexus was not involved equally, and why at the distal extremity branches given off at the same part differ so materially—some seriously affected, others remaining perfectly intact—remains yet to be explained.

Sycosis cured by Sulphite of Soda. By J. Y. Dale, M. D., Agricultural College, Pa.

In August, 1865, I was consulted by T. W., aged 23, a returned soldier, who had *sycosis menti*, which extended over his chin and the left side of his face. Having read of the influence of sulphite of soda on diseases of cryptogamic origin, it occurred to me that this would be a very good case in which to try its effects. I therefore prescribed for him as a local application sodæ sulphis gr. xl, aquæ ℥ij, glycerinæ ℥j, M., which was to be used frequently; and I directed him to keep his beard closely trimmed, but not to shave. In four days not a vestige of the eruption remained. The same remedy has proved equally effectual in three cases treated since then.

DOMESTIC SUMMARY.

Dermoid Tumour of the Conjunctiva.—Dr. F. P. Sprague records (*Boston Med. and Surg. Journ.*, Dec. 11, 1865) a case of this in a girl, eight years of age. The tumour was congenital, was situated one-third on the cornea and two-thirds on the sclerotica, and had hairs growing from it. The tumour was excised.

Dr. S. states that he has been "induced to report this case from the impression that these little tumours are quite rare. On looking over several authors, I could find no mention of them till I took up *Wecker on Diseases of the Eye*, a work now issuing from the French press. Wecker seems to have carefully collected all the observations on the subject, which, however, are few in number. He mentions only one case as seen by himself."

Dr. Sprague's investigations seem not to have been very carefully made; at all events, he has *overlooked* examples which were *near at hand.*

A similar case of a young lady, in which a tumour existed on each eye, was described, and figures given of the tumours by Dr. Taliaferro, of Cincinnati, in the No. of this Journal for July, 1841.

Mr. Lawrence, in his learned treatise on the diseases of the eye (see edition published by Blanchard & Lea in 1854, p. 341 *et seq.*)—a work which our Boston brethren seem to be entirely unacquainted with—refers to similar cases described by Wardrop, Mackenzie, Himly, Graefe (the elder), and Ammon. A case is recorded by Mr. W. White Cooper in *London Med. Gaz.*, Nov. 1841.

Mr. Tyrrell also has described and delineated (*Practical Work on the Diseases of the Eye*, vol. i. pl. 8, fig. 4) two small tumours of this kind, but without hairs.

All these cases will be found noticed in the edition of Mr. Lawrence's work referred to.

Experimental Investigations into the Action of the Bromide of Potassium.—This is the title of a very interesting paper by Dr. ROBERTS BARTHOLOW, in the November number of the *Cincinnati Lancet and Observer*. The author's investigations were conducted in three directions: 1st, the chemical properties; 2d, the physiological effects; and 3d the therapeutical uses of the salt.

The physiological effects of the article when taken into the stomach Dr. B. sums up as follows:—

"1. It proves irritant in large doses to the mucous membrane of the stomach.

"2. It is rapidly absorbed into the blood, and may be detected soon after in the urine.

"3. It acts upon the nervous centres, producing sedation, sleep, reduces the action of the heart and arteries, lowers the temperature, and diminishes the retrograde metamorphosis of tissue."

The prolonged administration of the bromide of potassium produces according to Dr. B., the following effects:—

"1st. It diminishes and ultimately entirely neutralizes the sexual appetite.

"2d. It produces weakness of the muscular system.

"3d. It is irritant to the stomach if given in considerable doses, and

"4th. It interferes with the secondary assimilation, lessening the retrograde metamorphosis of tissue."

In regard to its therapeutical uses Dr. B. extols it as a *disinfectant* and *deodorizer*, as an *escharotic* in sloughing and gangrenous ulcer, phagedenic chancres, hospital gangrene, epithelioma, &c.

"The actions of the bromide of potassium physiologically considered," Dr. B. states, "consist in a sedative or contra-stimulant effect upon the nervous centres, producing as secondary phenomena, sedation of the heart, anæmia of the brain, anaphrodisiac effects and diminution of the retrograde metamorphosis of tissue. It has come into use in various functional and organic nervous disorders, and in certain sexual diseases, where a calmative and sedative influence is desired."

This article Dr. B. considers to be indicated as a hypnotic in states of nervous excitement without congestion of the nervous centres; in hysterical insomnia; in delirium tremens; in the insomnia of excitable business men, or, in general terms, in those forms of insomnia dependent upon excitation without increased blood supply. Dr. B. has found it especially useful in irritable bladder, and the chordee of gleet. We have several times prescribed ourselves with benefit in these conditions.

For a careful survey of all the facts Dr. B. gives the following as the *methodus medendi* of the salt in question:—

"1st. The bromide of potassium acts by absorption into the blood.

"2d. Its effects are expended upon the nervous centres, or the cerebro-spinal axis.

"3d. Sedation of the heart and circulation, and the various local sedative effects are secondary results of the impression made upon the nervous centres.

"4th. Its physiological effects are not very decided, and are easily modified by any local disturbance.

"5th. Its therapeutical action is still more decidedly influenced by local morbid processes.

"6th. It is indicated where a sedative to the nervous system is required—in insomnia; too great reflex excitability; nervous and spasmodic affections of the larynx and bronchi-sexual excitement, and in an irritable state of the sexual organs.

"7th. It will be effectual in the foregoing conditions, in proportion to the degree in which structural lesions are absent, or in other words, in proportion to the degree in which these morbid states are functional rather than organic."

The bromide, Dr. B. asserts, possesses none of the peculiar alterant property of the iodide. Whilst this fact is true, it is undoubtedly the case that the bromide relieves congestion of certain organs, diminishes their bulk, or, as it may be styled, produces resolution of an engorgement. Such action, apparently alterative or resolvent, is not really so. It has been exhibited mainly in certain states of the uterus and ovaries—states of hyperæmia dependent upon sexual

excitement, or upon the monthly nisus. The apparent resolvent power is, in this case, due to the sedative impression of the remedy upon the sexual organs and upon the vaso-motor nerves.

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Treatment of a certain form of Paralysis occurring in Children.—Dr. Wm. A. Hammond relates (*New York Medical Journal*, December, 1865) three cases of that form of paralysis "consisting essentially of fatty atrophy of the muscles" successfully treated by the continuous galvanic current.

The first case was a boy five years of age who came under Dr. H.'s care "April 19, 1865, to be treated for paralysis of both lower extremities. During the previous summer the child had suffered from hooping-cough, and when the disease was at its height motion and sensation were suddenly lost in both legs from the hips down. Medical advice was at once obtained, and various measures were in consequence adopted, without any material benefit. Sea-bathing was then recommended, and this was faithfully persisted in for several months, with the result of restoring sensibility to both limbs, and motion to the muscles of the thighs. Since then strychnia had been administered, both by the stomach and by subcutaneous injections, without the least improvement being effected. Upon examination with the æsthesiometer I found the sensibility of both limbs tolerably good. The mercury of a delicate thermometer, the bulb of which was applied to the thigh, stood at 90°, whilst below the knees the temperature was but 82°. The child was able to flex, extend, rotate, abduct and adduct the thighs, and to flex and extend the legs. There was no power, however, over the feet, and upon careful examination I could not find that a single muscle situated below the knees was capable of contracting from strong induction currents. Both legs were atrophied. They were of the same size, being at the largest part six and a quarter inches in circumference.

"Aside from the paralysis the child appeared to be in good health. Its appetite was good, there was no pain, and it slept well at night.

"I directed that night and morning both legs should be put up to the knees in water of the temperature of 110°, and kept there for twenty minutes; that they should then be well rubbed for half an hour with a coarse towel, and the muscles kneaded for the same period; the child was also to be brought to me three times a week for faradization.

"This treatment was continued for three weeks with but little if any benefit. During this time I had continued to use very strong induction currents for fifteen minutes to each leg three times a week. The machine, which was very powerful, was put in action by a battery consisting of three Smee's cells. The current excited caused the most intense pain, but did not produce the slightest apparent contraction in any muscle. I then determined to make use of the constant current derived from a voltaic pile of one hundred pairs—and consequently possessed of great intensity. The poles were applied first to the tibialis anticus of the right leg. The instant the circuit was made the foot moved up. By continuing the experiment, I found that contractions could be induced in every muscle of both legs. I then had an arrangement constructed for making and breaking the circuit rapidly, and persevered with the treatment daily for a week. During the whole of this period, at every trial contractions were invariably induced in every muscle upon the circuit being made and broken. The warm water frictions and kneading were also continued. I now found that the temperature of the legs below the knees was 86°, and that the circumference was, at the former place of measurement, seven and one-eighth inches. The facts that the toes could now be slightly flexed and extended by voluntary efforts, and that there was some little power over the gastrocnemii muscles, assured me that the cure would ultimately be complete. In this hope I was not disappointed. Amendment continued, and on the 17th of August, when I saw the child for the last time professionally, power over all the muscles of both legs was almost completely restored. Very feeble induction currents now caused contraction. The tibialis anticus was still however, weak; but I have no doubt that by exercise it, as well as all the rest, will become well nourished and strong. At this date the circumference of the legs was eight and a half inches, and the temperature 90°."

This, with the two other cases, presents. Dr. H. remarks, "a fair idea of the action of the continuous galvanic current of great intensity in exciting muscular irritability when it has been apparently altogether lost, so far as other means enable us to determine. After contraction has been well established, and the will begins to assume its power over the affected muscles, I prefer to use the induced or faradaic currents, as being more local in their effects. The continuous current, as I propose to show in a subsequent memoir, does not limit its action to the part through which the galvanism passes, but affects distant regions of the body.

"The voltaic pile of which I make use is one which I devised myself, and which I find to possess great intensity. It is constructed of perforated zinc and copper gauze cut into square pieces soldered together, and the couples separated by pieces of woollen cloth. It is set in action by strong vinegar, a few seconds' contact of the poles (terminated by wet sponges) with the skin will cause vesication. Its use, therefore, requires caution. It cannot be applied to the face, or any part of the head and neck to which the fifth pair of nerves is distributed, without risk of causing great disturbance of vision and perhaps blindness from over-excitation of the retina."

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Uterine Tumours.—Dr. SANDS exhibited to the New York Pathological Society (June 14, 1865) a mass of uterine tumours, and gave the history of the case, as follows:—

"It is my painful duty to exhibit to the society a specimen obtained from a woman, whose death was caused by a surgical operation to which she submitted by my advice. She first came under my notice about three months ago, having been sent to me as the supposed subject of ovarian disease, by a medical gentleman in this city, with a view of having an operation performed. The patient was an unmarried woman, forty-five years of age, and of healthy parentage. She belonged to a long-lived family, and having a disease which she supposed would terminate her life in a short time, felt a natural anxiety to be cured, if possible, and to live as long as her ancestors had. I examined this woman with regard to her history, and I found that an abdominal tumour made its first appearance seven years before; the patient was very positive in saying that it first showed itself in the left iliac fossa; that the growth was at first gradual, but that in a year's time it had attained a very considerable size. Just at the time of consulting me her particular grievance was the weight of an umbilical hernia, in the sac of which was accumulated a considerable amount of peritoneal fluid. She represented to me that her health was suffering severely; that life, under the circumstances, had no attractions for her, and that she desired to have an operation performed. An examination of the tumour led me to suspect that it was not of ovarian but of uterine origin, although certain facts in her history and in her physical examination pointed strongly to the existence of ovarian disease. On inquiry I found that menstruation had never been excessive, but that occasionally she had suffered from a suspension of the flow; at no time had there been anything like uterine hemorrhage.

"The enlargement of the abdomen was very great. I did not measure it myself, but the measurement was made by my friend, Dr. Sabine, at the N. Y. Hospital. He found the greatest measurement around the umbilicus to be forty inches. The umbilical opening was circular in shape, two inches in diameter, and there was considerable distension of the sac. In order to prevent the protrusion of this hernia the patient had been obliged to wear a truss, and it was this inconvenience, added to that caused by the tumour, which led her to seek relief from an operation.

"This set of tumours (referring to the specimen) could be partly made out through the abdominal walls, which, by the way, had no very considerable thickness. I could distinguish this swelling, which is a fibrous tumour springing from the fundus of the uterus, immediately below the umbilicus. The uterus itself, which lies beneath, I could not distinguish through the parietes of the abdomen. I was able to feel a swelling of considerable firmness in the left iliac fossa, and a much larger one, in fact the largest of all, existed above and to the right. The tumour allowed an examination through the open umbilicus, and

the larger and smaller swellings could be separately distinguished. In regard to fluctuation, I was not certain. It is true that fluctuation existed, but the presence of some dropsical fluid in the abdominal cavity so masked the feeling of deeper fluctuation that, as I said before, I could not be positive about it. I made a vaginal examination, and with great difficulty was able to reach the os; there was no vaginal cervix, for the reason that the uterus had ascended so far from the outlet of the pelvis. The uterus was very decidedly to the left of the median line; I was confirmed in this opinion by the uterine sound, which took a direction upward and to the left. The instrument penetrated to the depth of 3½ inches, and, during an examination which Dr. Krackowizer had the kindness to make afterward, it penetrated about 4 inches. The instrument went up and to the left, and there did not seem to be any considerable thickness between the finger outside and the point of the instrument within the uterus. On endeavouring to move the uterus by rotation of the sound it was found impossible; but on taking the handle of the sound in the left hand, and moving the mass upon the left side with the right hand, a distinct movement was communicated to the handle of the instrument. This made me believe in the existence of a uterine rather than an ovarian tumour. I subjected the woman to several examinations, but was not able to arrive at any more satisfactory conclusion. I was induced to operate partly on account of the woman's urgent request, and partly because I thought it very manifest that her health was suffering from the burden of this swelling and the additional weight of the hernial protrusion, and also because I had made up my mind that uterine tumours could be successfully extirpated. I was led to this conclusion by reading the two cases given by Mr. Clay, of Manchester, and the one by Koeberly, of Strasburg. I omitted to state that there was very decided mobility of the abdominal swelling. The woman went to the hospital and was submitted to a formal consultation; an operation was decided upon, and this I performed on the 12th inst.

"The patient being placed under ether, the operation was commenced by an incision in the median line, about 3½ to 4 inches in extent, below the umbilicus. The abdominal cavity was reached with great facility. I introduced my right hand, and swept it over the left surface of the tumour, and with my left hand felt the right surface of the tumour, and could detect but a single adhesion of about three-quarters of an inch in extent to the greater omentum. I should state that at this time the diagnosis was still uncertain; it was not evident to those who saw the swelling through the incision what was the nature of the tumour. It was considered right to prolong the incision upward. I accordingly enlarged the incision, and thought it necessary to make a very long one, nearly up to the summit of the tumour. That being done, I was able, by placing my hand behind it, to dislodge it from the abdominal cavity, and bring it into view. It then did not appear to be a fibrous tumour, and I was so much in doubt of its character that I tapped it; but no fluid was found. To my great disappointment, on passing down into the pelvic cavity I found that my hand was arrested by large and firm adhesions. My impression was, at this time, that the further prosecution of the operation would be fatal to the patient; yet I readily yielded to the advice of my colleagues to proceed with the extirpation of the tumour, as I had reason to believe, with the other gentlemen present, that if the mass were returned the woman would certainly die, while by the removal of the mass she might have a chance of life. We accordingly commenced the dissection, which was a very difficult operation, as step by step we were met by dangers in the shape of bloodvessels of various sizes, large and small. Towards the last the operation had to be hurried, as the woman showed signs of fainting; and after much trouble, and a great deal of embarrassment, this tumour was finally removed. The mass was removed above the line of implantation of the vagina into the cervix uteri. As soon as this was completed, it became evident that there was very alarming exhausting hemorrhage. The sponges were removed, and pressure made upon the bleeding points, and these points were secured as fast as possible. The main hemorrhage was found to come from a rent in the common iliac vein. The summit of the bladder was unavoidably ruptured; it was, however, closed again by the application of a ligature. The operation consumed about one hour and a half, and, notwithstanding the free use of stimu-

lants, the patient sank and died a few minutes after its completion. Death, in my opinion, was mainly due to hemorrhage, taking place from large bloodvessels in the pelvic cavity, which were unavoidably lacerated during the operation. Regretting, as I do, the unfortunate termination of the case, I am still inclined to regard the disaster as one which might happen in the extirpation of an ovarian as well as a uterine tumour, and can see no reason why, in the absence of deep-seated, extensive adhesions, the removal of the uterus might not be accomplished with a favourable result.

"An examination of the mass removed shows it to consist of the uterus and appendages, the former being the seat of a large number of fibrous tumours, some of which are developed in its walls, the largest, however, forming nearly independent growths, connected with the uterus only by long narrow pedicles. The uterus itself is nodulated externally, but preserves nearly its regular figure; it is greatly hypertrophied, however, measuring nine inches in its longest diameter. The uterine sound can be made to pass over seven inches through a somewhat tortuous canal. The mucous membrane lining the interior is slightly thickened and vascular, but otherwise healthy. The principal outgrowths from the uterus are three in number, one attached to the summit and one to either side of the body of the organ—that upon the right side being the largest. On section these tumours exhibit the usual appearances of the softer variety of fibrous growth, resembling in many places œdematous areolar tissue. The largest tumour—that in the right side—is the seat of several cysts containing serum. The mass, three days after removal, weighed sixteen pounds, but as it diminished considerably in bulk from the loss of fluid during the interval, it is estimated to have exceeded twenty pounds in weight at the time of the operation."—*New York Medical Journal*, December, 1865.

Bifid Uterus and Double Vagina.—The following interesting example of this malformation was communicated to the Boston Society for Medical Improvement (Aug. 28) by Dr. A. B. HOYT, late Surgeon 25th Mass. Vols.:—

The subject of it, aged 57 years, died of a cancerous tumour occupying the left iliac region. She had always been healthy until this disease made its appearance. There had been nothing unusual with regard to menstruation, which ceased at the age of 40. She had given birth to three children; her labours were always severe—the last one unusually so; this occurred twenty years before her death, and was achieved without instruments. The two previous confinements were protracted, but whether there was any abnormal presentation, or if instrumental aid was required, is not known. Her husband, during the patient's life, was ignorant of the fact that any unnatural condition existed. When pregnant, and whilst lactation was going on, menstruation was always suspended.

At the autopsy, the malformation was revealed for the first time, though there were some reasons for thinking that its existence had been known to the patient herself.

On examining the organ, it was found that there were two vaginæ, about equal in size, the left one perhaps a little the largest, and similar as to walls, rugæ, &c. They extended from just within the vulva to the uterus, and were separated by an interval filled with compact cellular tissue. Close to the uterus the vaginæ communicated with each other through an opening of about one-fourth of an inch in diameter. From each vagina a probe passed into a separate uterine cavity. The os uteri in each vagina was small and imperfectly developed, as also was its orifice. The organ, as thus composed, was hardly larger than the normal uterus, but about one and a half inches from the os, it bifurcated into two symmetrical cornua, as large round as the forefinger, and about one and a half inches long; these terminated in the Fallopian tubes, which, with the ovaries and broad ligament, were natural. There was but one ovary to each cornu. The cornua were covered with peritoneum, except where the two layers of the broad ligament separated, and it also covered what might be called the fundus of the compound portion of the uterus. There was nothing to indicate that one side of the uterus had been impregnated and not the other, unless it was the greater capacity of the left vagina.—*Boston Med. and Surg. Journal*, October 26, 1865.

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[Jan. and April.]

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Baltimore, Aug. 10, 1865.

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